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Cover illustration: *Bust of Sir Thomas Spencer Wells, pioneer of Naval medicine (See paper on page 44) part of the historic collection of the RNMS now with the Institute of Naval Medicine*



Surgeon R[illegible] M[illegible] M.F.W.H.T. and QHS [illegible] is appointed [illegible] Medical Director General
(Naval) [illegible] March 1997

Editorial

Vive la difference!

Regardless of their conviction to Purple Inter operability with our sister Medical Services most Naval serving medical and nursing staff appear to lay appreciable store on preserving Dark Blue tribal totems points of reference which re emphasise the attractions which drew us to serve in the Royal Navy and the history and heritage maritime traditions and environment which continue to bind us together and set us apart from but not against our colleagues and friends in the other Services So it was not surprising to me when readers expressed concerns that transfer of the Royal Naval Hospital at Haslar from the Royal Navy might be coupled with loss of a focal point for a Service role which that hospital fulfilled for many years Specific concern has been expressed about the fate of the historic library and collections from the hospitals at Gosport and Plymouth

All may be assured that, in the midst of all the deliberations about the future the past and the importance of history heritage and tribalism was not forgotten Last year the Institute of Naval Medicine was accorded the privilege of providing the focal point for the Royal Naval Medical Service The Institute has excellent conference facilities and gardens and staff have been pleased to host corporate functions to date and this year will welcome guests to several occasions including the Royal Naval Medical Club reception the QARNNS Association AGM and in the autumn the Primary Care Symposium on Operational Medicine The historic libraries archives and a wide variety of accumulated memorabilia from the hospitals at Gosport and Plymouth were packed into several hundred boxes and, having been stored minally in Royal Clarence Yard recently arrived at the Institute A start has been made on restoring access to the books and archives and to mount small occasional and more permanent exhibitions such as that to be launched by the QARNNS Association at its AGM in June Already the Hampshire Museum Service is providing computer cataloguing assistance initially for the QARNNS archives and arrangements are being made for the group of volunteers from the National Association of Decorative and Fine Arts who have looked after the books for several years to resume conservation in September There will be in opportunity for a variety of volunteer work over the next year or so So rather than being forgotten our tribal focus has moved but a mile or so la difference vit toujours !

Part of the heritage already on display at the Institute is a collection of boards listing those who have served in senior medical and nursing appointments in the Royal Navy at home and overseas Sadly at least one board will be added to that collection in the next few months as the Royal Navy leaves Hong Kong in June the Debating Point paper in this edition may well be the last RN medical publication from that outpost A second board may be added in due course should the current trial of transferring inpatient care in Gibraltar from the Royal Naval Hospital to St Bernard s Hospital lead to the closure of the Naval Hospital In slight consolation the increased integration of Medical Services has provided new opportunities for uni medical and nursing staff to serve overseas in hospitals which until recently were almost the sole preserve of Army or Royal Air Force personnel though the Army territory includes less welcome posts such as Northern Ireland and Bosnia!

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Updates

Looking to the future

Most recent key with the Defence Cost Study dominated our lives in the last 12 months. Pre DCS 15 attitudes have stayed with us like a phantom limb following amputation but we must now move forwards. The Armed Forces have been reshaped to meet the requirements of today's international scene. It is for us to tailor the Royal Naval Medical Service to fit this shape.

The maintenance of the Royal Navy's Operational Capability remains the raison d'etre for the existence of the Royal Naval Medical Service. Our ability and that of the other two Services in this area is being investigated firstly shortages of personnel have been questioned by the House of Commons Defence Committee and secondly operational capability both manpower and material has been audited by the Director of Operational Capability (DOC). Both organisations revealed shortcomings which will come as no surprise but this attention has given renewed impetus to a search for a way ahead. DCS15 gave us our present position, work is now required to compare this to our operational requirements and identify any shortfall.

To achieve this the Chiefs of Staff have commissioned the Operational Medical Study Team (OMST) to review all aspects of operational medical support. The first stage of their deliberations has been to look closely at the derivation of casualty rates and population at risk in four key levels of deployment. Both parameters are fundamental to the provision of medical support and their establishment will provide a firm ground from on which to base further work.

In parallel with this study it is my intention to review operational links linking these wherever possible to an individual. This has been tried before in a limited extent with the Royal Marines Surgical Support Teams and will not only give the individual a clear indication of his or her war role, but will also allow operational training to be focused both on the individual's requirements and the requirements of the group within which they will be working.

The various study groups have to a degree distracted us from our normal peacetime task and we still [illegible] both in [illegible] forces personnel. [illegible] in maintaining the high [illegible] operations. It is this specific [illegible] care, allied to an awareness of the employability criteria which makes the [illegible] uniformed core of expertise so essential to the operational requirement.

That having been said we rely heavily on the support of our civilian colleagues many of whom are now doing jobs previously undertaken by Service personnel. It is up to every one of us to make sure that they receive the training and time to adapt their skills to suit the Naval environment. A navy wide primary care audit programme is shortly to start. This will allow us to look closely at the way in which support to establishments is being provided and also provide a mechanism by which the concerns of the primary care area can be properly represented.

Recruiting is buoyant in all categories. This is however pointless without the ability to retain trained personnel. Considerable advances have been made towards individually tailored commissions for Medical Officers the Short Career Commission can now be extended to cover the full period of Higher Professional Training the three year Return of Service requirement starts from the date of completion of training the Medium Career Commission has been reintroduced but other changes to the Terms of Service have been delayed and are still under consideration. It is one of my highest priorities to bring revised Terms and Conditions of Service into being at the earliest opportunity.

The QARNNS have since 1977 been in the anomalous situation where QARNNS Officers are commissioned into the Royal Navy but QARNNS Ratings engage specifically into the QARNNS. There are no legal reasons why QARNNS cannot become a discrete branch within the RN. A draft submission to the Navy Board is being progressed and I look forward to welcoming the QARNNS into the Royal Navy in due course.

One change that the incorporation of the QARNNS into the Royal Navy will bring about is the introduction of a Reserve Liability for QARNNS personnel engaging under the new Terms and Conditions of Service The revised Reserve Forces Act (RFA 96) came into force on 1 April 1997 The Act will provide greater flexibility for the use of Reservists and I look for an early opportunity to conduct a joint Regular and Reservist exercise on board RFA *Argus*. Recruiting into the Royal Naval Reserve Medical Service has not been good A new recruiting video is just about to be released but inevitably our greatest recruiting asset is word of mouth

The Defence Secondary Care Agency Defence Dental Agency and Medical Supplies Agency are reaching the end of their first year The Defence Medical Training Organisation launched as an integrated agency on 1 April 1997 The Initial Operating Principles have been steep Revised Key Targets for the agencies are currently under negotiation but are already being tightened and directed more clearly to achievement of the objectives each agency has been given

We must make sure the medical agencies fully meet our demands not only in the service they deliver but also in providing us with interesting and challenging careers The key to all of this is good communications I therefore return to my opening theme and invite you to look ahead

M P W H Paine QHS
Surgeon Rear Admiral
Medical Director General (Naval)

Focus on QARNNS

I joined QARNNS in 1965 to undertake my State Registered Nurse training Not intending to stay longer than the four year engagement I now find myself writing a few lines for the Journal of the Royal Naval Medical Service as Matron in Chief Casting my mind back the time has sped by with ever increasing speed much like the first third of 1997! QARNNS Officers commenced the year with a fine mess dinner held in the beautiful Commando Forces Officers Mess Royal Marines with an abundance of *esprit de corps* The event had a smattering of sadness for we were saying farewell to our Matron in Chief Captain C M Taylor RRC on her retirement Captain Taylor had vision and a wealth of experience which will be sorely missed by all her colleagues We wish her well in her retirement and intended travels across the globe

I envisage that QARNNS remain flexible to the requirement of the Fleet within the latter end of the 1990s and beyond the main issues set by my predecessor are beginning to bear fruit The amalgamation of the MA and MA(Q) advancement rosters for personnel with a sea service liability became effective 1 April 1997 This roster now equates to all other rosters in branches within the Naval Service that have complement sea billets The integration of the MA(Q) into the MA Branch of the Royal Navy formal incorporation of QARNNS into the Royal Navy and the Medical Technicians (M) into QARNNS are all top priority in the corridors of Victory Building



The foundation on which QARNNS was built became fragile in these last eighteen months to two years but we are now into the second year of working alongside our sister Services I am consoled to some extent in the realisation that all three Nursing Services have the same difficulties to contend with be it the reduced manpower or the

incorrect skill mix equation However we must concentrate our energies towards making the best use of existing resources and build upon the structure we now have in place My predecessors have all experienced changes to varying degrees and I inherit nothing new

The balance between work and extracurricular activities is vital and I am heartened when I hear that staff in Gibraltar have raised enough money through various events to send a child with special needs with the Handicapped Childrens Pilgrimage Trust (Royal Navy) to Lourdes Also during leave and at their own expense four QARNNS personnel attended to care for the safety and well being of the children They were PONN G Wright (MDHU Dernford) PONN L Christophers (RNH Gibraltar) LNN K Procter (RNH Gibraltar) and LNN B Swire (RH Haslar) Lieutenants S Spencer and N Piper headed off to Morocco for the exercise Spring Run during which they walked 100 kilometres climbed and descended 33 000 feet and held a mess dinner in the desert at which they raised £220 for charity in fines! PONN D Stone (RH Haslar) was a member of the RN team which endeavoured to walk the John Muir Trail in the Sierra Nevada Mountains of California We have also read the article in the Journal of Lieutenant C Doughty (Health Studies Division DOLPHIN) and LNN D Joseph (RH Haslar) visiting the United States as part of the Royal Naval Womens Tennis Team

On operational commitments LNNs D Kirtu and A Triggol (MDHU Dernford) are on a four month deployment to Bosnia as part of a combine surgical team and PONN G Wright (MDH Dernford) completed detached duty with th Medical Staff of the First Battalion of the Roy Scots for their live firing exercise in Kenya

These activities alone highlight th QARNNS continue to be highly adaptable varying scenarios The change in the in Servic core hospital and the Health Studies Divisio where the three single Service schools of Nursin were combined was enormous but we mu move on and work towards developing a u Service culture yet retaining single Servi identity and ethos Within QARNNS and th Nursing Profession change is the one eleme which has remained constant It is not new It part of organisational life It is essential th QARNNS create innovate and encourag progress so as to strengthen weak areas and deliver improved care to our patients and to o Service colleagues

P M Hambling ARRC QHN
Captain QARNN
Matron in Chi

THE NAAFI SELECT CATALOGUE

Naafi has introduced a brand new mail order non-food catalogue, Naafi Select, tailor made for the Armed Forces and their families all over the world

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Naafinews

Debating point

Recertification – time to bite the bullet

N S Bevan

In the world of General Practice, one current hot topic is that of recertification. We have 'minimum-competence' assessment firmly established whereby all general practitioners must submit themselves to a summative assessment at the end of their vocational training. The mechanism of this assessment process has attracted some criticism[1] but it is still in its infancy and has been equipped with a number of safety features to maximise fairness and validity. No doubt the whole process will be refined over and over as experience accrues. Its purpose is to identify that small percentage of registrars who have failed to reach a minimum acceptable level of competence despite their training programme. Eyes are now turning to the established practitioner.

It seems inevitable that in the same way some practitioners will fail to keep pace with the rapid development of family medicine and maintain their competence. Although the number is likely to be small it is reasonably argued that this minority could nonetheless inflict disproportionate damage on patient confidence and the reputation of the profession as a whole. Hence the development of a system is being sought to identify such practitioners so that they can be helped.

Such an idea is unlikely to enjoy popular acclaim amongst all doctors. At best it sounds threatening and at worst it sounds positively dangerous! And besides, nobody else is doing it – so why put our heads on the chopping block? Who is going to examine us? (Some crusty academic out of touch with the cold face of daily clinical practice?) And is his or her opinion going to be more valid than ours anyway? Perhaps but only if it is an expression of best practice.

In a world of rapidly expanding information technology the traditional concept of the medical curriculum becomes less and less valid. Even though we are still a long way from having all the answers this is nonetheless a relatively straightforward task to tap readily accessible data from worldwide sources – the Cochrane Collaboration (a multi-centre clinical data collection and evaluation effort for identifying optimum treatments in general practice is an obvious example. Hence with the explosion of rich data there is less and less reason for patients to receive anything other than best practice based on available data.

The use of protocols and guidelines should ensure the widest possible use of such practice and these lend themselves to quality assurance by auditing – which in a nutshell is what recertification will be all about. No one will be expected to sit down in examination conditions and recite Krebs's cycle or any other academia which is irrelevant to his particular needs. Recertification will almost certainly entail an evaluation of one's daily practice by one's peers and when a number of such evaluations have been conducted a minimum acceptable standard will emerge although certain objective minimums will obviously apply. Anything less we should not tolerate as a profession and our patients should not be expected to do so either.

Some GP practices already take part voluntarily in peer assessment whereby a practice invites another practice to assess them and then the evaluation is subsequently reciprocated. Participants find this a valuable exercise with potential benefits for everyone concerned and it is now firmly established in the programme in some areas. Recertification is the next logical step from this and although it will take time to establish formally on a national scale – when it arrives our professional pride should embrace it. It is not the bête noir some would have us believe and is long as we maintain our awareness through regular reading, CME and interaction with our colleagues this should not be such a painful bullet to bite after all.

At the time of writing: Surgeon Commander Bevan was Base Medical Officer HMS *Tamar* Hong Kong.

Reference

1 Rhydes M, Wolf A. The summative assessment package: a researcher's look. Education for General Practice 1997; 8: 1–7.

J Royal Naval Medical Service 1997 83(1):8–13

Operational Medicine

Aeromedical evacuation in Bosnia

A K Dashfield, H R Smith and P C Young

Abstract

The objective of this study was to assess the value of aeromedical evacuation when compared to road ambulance transportation in medically treated patients in a rural environment. Primarily trauma was the most common presenting illness. Of 4795 evacuees to secondary care facilities were using an Italian airfield were poor with a risk of being mined. Data were collected on all British aeromedical flights in Multinational Division Southwest Bosnia Herzegovina during the period and benefit to the patient was assessed by a panel of experts when compared to calculated road ambulance evacuation. Sixty nine patients were evacuated by air on 57 flights and transported to secondary care facility for further management. The panel of experts decided that only 15 of the 69 patients (22%) had benefited from aeromedical evacuation. This study again shows the low number of patients from undescribed aeromedical evacuation despite the air ambulance being operated in a relatively ideal road environment with a high percentage of trauma. Poor road communications, poor road conditions, Crew safety and mines further highlight the need to devise a system to screen out unnecessary flights and identify those patients who would benefit most.

Introduction

Emergency aeromedical services have been used extensively for military medical evacuation since the Korean war. The potential benefits of air ambulances are the speed with which expert help can reach the site of injury or illness and the faster return of the patient to a secondary care facility.

Following the Dayton Peace Accord the Implementation Force (IFOR) was tasked with maintaining the cease fire in Bosnia Herzegovina starting on 16 December 1995. The Multi National Division Southwest (MND(SW)) controlled an area roughly the same size as Wales. The mountainous terrain with poor road conditions made land transportation difficult and slow. Furthermore many roads were mined. Extremes of weather during winter made many roads impassable. The division consisted of mainly British troops with smaller contingents of Dutch, Canadian, Czech and Malaysian soldiers contributing to the 15 000 strong force.

Emergency aeromedical services are currently a subject of debate in the medical press, being viewed with scepticism in some quarters[1,2]. There has been very little research into military aeromedical evacuation.

The unique patient population and circumstances in MND(SW) where trauma was the commonest cause for aeromedical evacuation provided an opportunity to investigate claims that emergency air services increased survival rate in severe trauma cases[3–9].

Methods

Statistics of aeromedical evacuation during the first six months of MND(SW) operations were reviewed to assess the type of case which was being evacuated by helicopter and possible ways of improving the casevac service.

The time from requesting medical evacuation to arrival in a secondary care facility was compared between helicopter and road transport. Timings for aeromedical evacuation were recorded by Medical Operations MND(SW) and times were calculated for the alternative road transport route to the nearest secondary care facility. When calculating road transport times road conditions and weather conditions were taken into account. Road transport times were estimated by a group of front Royal Marines who had driven all road routes used by MND(SW) personally and had been serving in Bosnia at various times over the last

Surgeon Lieutenant Commander Dashfield is currently appointed to Derriford Hospital, Plymouth as a Specialist Registrar in the Department of Anaesthesia. Major Smith is currently appointed as a Specialist Registrar in the Department of Dermatology, Royal Hospital Haslar and Surgeon Lieutenant Commander Young is a Specialist Registrar in The John Radcliffe Hospital, Oxford. The data for this study were collected while the authors were appointed to 22 Field Hospital, RAMC and serving with the NATO Implementation Force (IFOR) in Bosnia.

three years. Thus they had detailed knowledge of both road and weather conditions throughout the year. A record of weather conditions was obtained from the meteorological records held at Headquarters MND(SW). A panel of experts used a modified Delphi study reviewed the data available from each patient and assessed whether helicopter evacuation was likely to have altered the outcome. The panel consisted of a civilian consultant in accident and emergency medicine and two consultant anaesthetists with an interest in trauma, one being a Royal Naval anaesthetist and the other being a civilian. All three members of the panel were employed at a 1200 bedded district general hospital and were entirely independent of MND(SW) and are not authors of this paper.

The data reviewed were the severity of the presenting condition, medical treatment received by the patient prior to the arrival of the aircraft, treatment administered during helicopter transfer to the secondary care facility and transfer time compared to road transport. The medical expertise on the ground prior to arrival of the aircraft was assumed to be of the same standard as a non-paramedic civilian ambulance when a doctor was not on the scene. If a doctor was at the scene prior to arrival of the aircraft, this was also taken into consideration. Furthermore, use of the time saved by aeromedical evacuation with regard to patient management was assessed. An assessment could then be made of likely benefit derived from aeromedical evacuation. After reviewing data on each patient, the panel of experts were asked to answer with either yes or no as to whether aeromedical evacuation was likely to have been life saving or have avoided life threatening complications which may have developed if road ambulance had been used. Each member of the panel came to an independent decision and a majority verdict was taken for each patient. There was no formal scoring system and each member of the panel formed an opinion based on clinical information provided and their own personal judgement.

Helicopter service

Based initially in Gornji Vakuf and from 30 April 1996 in Banjaluka (Figure 1), a Sea King Mark IV aircraft of 845 Naval Air Squadron was on permanent standby for aeromedical evacuation. The helicopter was staffed by two pilots, an aircrewman, a paramedic and an anaesthetist. The Sea King is capable of operating at night using night vision goggles. Furthermore, the medical team can be winched down into inaccessible areas and the casualty on a stretcher winched back to the aircraft.

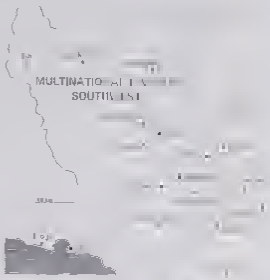


Figure 1 Main British locations in Bosnia Herzegovina. Multinational Division Southwest is the British controlled IFOR division.

Control of aeromedical evacuations

All requests for aeromedical evacuation were processed by the medical operations desk at Divisional Headquarters of MND(SW). On entering the theatre of operations every member of MND(SW) was given an aide memoire. This provided relevant information for summoning help via the medical operations desk and on geographical locations of medical facilities. Thus all major injuries passed through the medical operations desk. The officer manning the desk could have either a medical nursing or veterinary background. The decision to scramble the aircraft would be made by this authority often relying on information from non medical personnel at the scene.

Table 1 Patients evacuated by air ambulance

	n	%
Total cases	68	100
Type of incident		
Mine injuries	7	10.2
RTAs	31	44.9
Gunshot wounds	2	2.9
Primary trauma emergencies	12	17.6
Fire burns	6	6
Deliberate self harm	1	1.5
Coronary emergencies	2	2.9
Other medical emergencies	8	11.6

Results

During the study period (1 December 1995 to 16 June 1996) the helicopter was dispatched on 57 missions assisting 69 patients (*Table* 1). Only 15 of the 69 patients (22%) were thought to have benefited and that outcome had been affected positively by aeromedical evacuation (*Table* 2). Those patients thought not to have benefited all had injuries that were judged too minor apart from one case who had extremely severe head injuries and who died in the helicopter. Of the 69 cases only four required a majority decision by the panel. The mean response time of the helicopter was 35 minutes.

Discussion

Seventy eight percent of patients did not benefit from air ambulance and would have done just as well in a road ambulance. Our patient population was spread across a rural area and trauma was the commonest reason for aeromedical evacuation (75%). All but one previous study have identified patients with trauma in a rural setting as benefiting most from an air ambulance, thus the small benefits for trauma patients are in contrast with other data[5–9].

There may be several reasons for these results. The reliability and validity of expert judgment can be questioned[12] and anyone involved may be influenced by their attitude to helicopter programmes. The multidisciplinary structure of the panel and the fact that none of the panel of experts were directly involved in either military or civilian aeromedical evacuation is likely to reduce the risk of bias however. The small percentage of patients who were thought to have actually benefited from helicopter evacuation (22%) may be a reflection of the high number of inappropriate flights. The method by which requests for call out were processed in this study was not uniform. The controller at the medical operations desk relied on often incomplete information due to disrupted communication systems or poor assessment of the patient at the scene.

The mechanism for call out of civilian Helicopter Emergency Ambulance Services (HEAS) in England and Wales is via the local ambulance control. This is usually in response to 999 calls from the general public or requests for assistance from ambulance personnel or police already on the scene. Call out procedures in Germany are similar to those in England and Wales, with all call outs being coordinated and activation decisions made in ambulance control.

Despite the high proportion of trauma in our study a very high percentage of patients had minor trauma. Only 12 patients had major trauma (17%). The greatest benefit of air transport is seen in those with severe trauma. There was no systematic assessment of injury severity such as is used by some civilian ambulance services to formally score the need for helicopter evacuation[5]. The Westcountry Ambulance Service (Devon and Cornwall air ambulances) have devised a small handbook to assist land ambulance crews in the mobilization of the air ambulance helicopter. This handbook is available on each emergency vehicle as a guideline and provides questions and answers type of guide to aid the decision making process (*Figure* 2).

Similar results to ours were obtained in a recent study[1] where only 11% of the patients were thought to have benefited from helicopter evacuation. Of this 11% the majority of cases were victims of major trauma. Similarly this paper highlighted inappropriate tasking of the air ambulance both in non trauma and trauma cases as the main reason for such a low percentage of appropriate flights. The patient population in the work from Norway were also spread over a large rural area with relatively poor road conditions circumstances which at first sight would seem ideal for operating an air ambulance service.

During 1988–92 the rate of fatal accidents to ambulance helicopters in Norway was about 6 per 100 000 hrs flown (Per Kristunsen Nation Health Insurance). The reported fatal accident rate from the USA and Germany is approximately per 100 000 hrs flown[11,12]. The total operating costs of dedicated helicopter ambulance services in UK studies ranges from £600 000 p.a. for small paramedically crewed helicopter operating 8 hours a day in Cornwall[A] to £1·2 million p.a. for the larger medically crewed helicopter based at the Royal London Hospital. The current fuel and maintenance costs of keeping a Royal Naval Sea King aircraft airborne for one hour is £7000.

It is our view that benefit analysis of aeromedical evacuation is important. Apart from financial considerations helicopter transfer in cases which do not benefit may not have a neutral effect but may cause harm by exposing the patient and aircrew to unnecessary risk.

Conclusion

The rural setting with poor road communications in a population presenting mainly with trauma provided a unique opportunity to examine previous claims in favour of air ambulance services. This study again shows the low benefit from indiscriminate use of aeromedical evacuation, even with trauma patients. On

Table 2 Patients affected positively by aeromedical evacuation

Patient number (sex age)	*Diagnosis*	*Time from onset of symptoms to helicopter arrival (min)*	*Treatment before arrival of helicopter*	*Treatment given by helicopter team*	*Treatment in hospital during saved time*	*Time saved (min)*
1 male 25 years	Blast injury left lower limb	65	Pressure dressing IM morphine	IVI oxygen pressure Dressing	Theatre debridement vascular repair	115
2 male 22 years	Head injury GCS 3	36	Airway cleared	Intubation IPPV CPR Defibrillated	IPPV died shortly after arrival	184
3 male 22 years	Fractured distal femur severed popliteal artery	65	Nil	IVI oxygen morphine	Surgery vascular repair	175
4 male 31 years	Fragmentation injuries to abdomen and lower limbs	30	IVI IM morphine	Oxygen IV fluids	Laparotomy	40
5 male 26 years	Gunshot wound to face	30	Nil	Secured airway IVI	Surgery	120
6 male 25 years	Bilateral fractured femurs compound left tibia and left humerus concussion hypothermic hypovolaemic	35	IM morphine	IVI oxygen fracture immobilisation	Further resuscitation rewarming analgesia elective ventilation	33
7 male 19 years	Fractured pelvis and femur	38	IVI-morphine	Oxygen	Surgery	170
8 male 18 years	Gunshot wound the head	48	Intubated and ventilated IVI	Continued ventilation	Surgery	203
9 male 20 years	Gunshot wound to left shoulder left pneumothorax	35	IVI analgesia oxygen chest drain	Continued oxygen and monitoring	Surgery	160
10 male 28 years	Penetrating eye injury	256	Nil	Nursed head up	Surgery	280
11 male 28 years	Acute asthema	36	Nil	Inhaled salbutamol oxygen	Nebulised salbutamol IV hydrocortisone	80
12 male 28 years	Head injury GCS 3	25	Cleared airway	Intubated ventilated oxygen	CT scan ITU	175
13 male 23 years	Traumatic amputation lower limb	30	Morphine IM dressing	IVI oxygen pressure dressing	Surgery	82
14 male 25 years	C3–C4 fracture	36	Hard collet	Nil	CT scan traction	270
15 male 18 years	Meningitis	60	IVI IV penicillin oxygen	Oxygen IV fluids	ITU	200

SHOULD AIR AMBULANCE BE USED?

ACCESS- Is this location difficult or inaccessible?
AVIATION INCIDENT- Is this an actual or potential aviation incident?
BOMB INCIDENT– Is this a bomb threat or confirmed explosion?
THERAPY FREE INTERVAL- Will the air ambulance significantly reduce this?
HOSPITAL- Will land journey cause deterioration in the patient's condition?
MAJOR INCIDENT- Does the patient require immediate transportation to a specialized unit direct from the scene of the incident, e g
Carbon monoxide poisoning
Decompression sickness
Spinal injuries
Neurological damage
Burns
Amputation

If the answer is yes to any of the above questions use of air ambulance must be considered

MEDICAL CONDITIONS WHERE THE AIR AMBULANCE *CAN BE CONSIDERED*

AMPUTATION
ABDOMINAL PROBLEMS
AIRWAY PROBLEMS
ANAPHYLACTIC REACTIONS
BOMB INCIDENTS
BURNS
CARBON MONOXIDE POISONING
CEREBRO-VASCULAR EPISODE
CHEMICAL INCIDENT
CHEST PAIN
CHEST INJURIES
CHOKING INCIDENTS
CRUSH INJURIES
DECOMPRESSION SICKNESS
DIABETIC EPISODE
DRUG OVERDOSE
HEAD INJURIES
HORSE RIDING ACCIDENT
INDUSTRIAL INJURIES
MULTI-SYSTEM TRAUMA
NECK INJURIES
NEUROLOGICAL CONDITIONS
POISONING
RESPIRATORY PROBLEMS
ROAD TRAFFIC ACCIDENT
ROCK-CLIMBING INJURIES
SPINAL INJURIES
UNCONSCIOUS PATIENT

***NOT SUITABLE* FOR AIR AMBULANCE OPERATIONS**

MATERNITY CASES AT AN ADVANCED STAGE
MENTAL INSTABILITY
STATUS EPILEPTICUS

MEDICAL CONDITIONS WHERE THE AIR AMBULANCE *SHOULD BE USED*

CARBON MONOXIDE POISONING
DECOMPRESSION SICKNESS
CARDIAC RELATED INCIDENT
INTER-HOSPITAL TRANSFERS
SPINAL INJURIES
ROAD TRAFFIC ACCIDENTS with
Associated fatalities
Crush injuries
Ejected passengers
High energy impact
Multi-system trauma
Pedestrian in 20mph + impact

Figure 2 Air Ambulance guidelines as supplied by Westcountry Ambulance Service (Devon and Cornwall Air Ambulances)

p ients with major trauma have bcn l l
b n fit from air transportation The less l l bc
learned is to be more selective There is a need t
dv se a system that can screen out nnnecessary
flights and identify those patients who would
b nefit most Identifying such patients relies both
on accurate information from the scene as well as
appropriate processing of snch information More
widespread use of written guidelines for untrained
p ple at the site of injury and improved training
of controllers in assessing that information is
required Recent developments in computer aided
dispatch systems capable of fnrnal andit may be
useful for this function in the future

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Ambulance

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The Sir James Watt Hyperbaric Medicine Unit – An Asset to the Royal Hospital Haslar and the Defence Medical Services

J R Broome

Military diving operations are inherently dangerous but in wartime when the safe operating envelopes for depth and time are pushed to their limits the risk of accidents and decompression illness (DCI) may rise substantially Similarly in aircrew of pressurised military aircraft the risk of decompression illness is increased during hostilities Effective treatment of DCI in one of its many forms involves timely diagnosis evacuation to a treatment facility and the judicious application of recompression therapy oxygen and supportive care The aim of treatment is to allow highly skilled personnel (e g SBS mine clearance or Royal Engineer divers aircrew) to return to their operational tasks as rapidly as possible These are the *raisons d'etre* for retaining hyperbaric medicine expertise within the British military

The Royal Navy is the lead service for diving operations and the Medical Director General (Navy) is required to provide medical support for military diving operations worldwide To achieve and maintain this capability requires medical personnel who understand the complexities of diving physiology and who are skilled in the prevention and clinical management of diving related illness Such expertise is not widely available in the civil sector consequently the RN must generate and retain its own specialists

For many years the Institute of Naval Medicine (INM) has trained military medical officers in diving medicine To support this training requirement INM maintains a 24-hour advisory and treatment service for both military and civilian diving accidents and cases requiring hyperbaric treatment this service provides the clinical material by which trainee medical officers gain practical hands on experience of managing sick patients in a hyperbaric environment Until the late 1980s the hyperbaric treatments were carried out in HMS *Vernon* (later HMS *Nelson* [Gunwharf]) in a chamber manned by RN mar clearance divers but with the closure of Gunwha and the pressure on RN manpower the treatme service was taken on by the (then) Admiral Research Establishment (ARE) in Alverstok which employed MOD civilian technical staff ARF later became the Defence Evaluation and Research Agency (DERA)

DERA's 40 year old compression chambers a Alverstoke did not conform to HSE standards and required major refurbishment There was also an increasing workload of both divers and acutely ill patients with conditions such as smoke inhalation and carbon monoxide poisoning and proble wounds The Alverstoke chambers were designed for experimental diving work and it was increasingly apparent that they were not be suited to the treatment of patients requiri intensive care access was through narrow circul hatches which made transfer of ventilated patien in and out of the chamber difficult Furthermor the unpredictable absence of anaesthetic/ITU staff from RNH Haslar to attend ventilated patien and the logistic requirements for ambulan transfer to and from Alverstoke marked complicated the issue.

In 1994 the Surgeon Rear Admiral (Support Medical Services) directed that a hyperbar chamber be installed in RNH Haslar a Hyperbar Medicine Unit was seen as a useful addition Haslar's clinical facilities The unit was planned operate as a three way partnership between Hasl (who would provide all resources related to patien care and a building to house the chamber) DER (who would supply install and maintain t chamber and provide the technical staff to oper it) and INM (who would provide 24 hour medica officer cover)

The Unit accepted its first patient on 22 Jul 1996 and at the time of writing more than 1 treatments have been performed on nearly patients (90% emergencies) treatments in involved more than 230 hours of chamber tre The RH Haslar Hyperbaric Medicine Unit (HM

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is the only unit in SE England in which ventilated patients can be treated cases are referred from a wide catchment area, including Greater London and beyond.

Several Service patients have been treated to good effect after referral by Haslar clinicians An example of these was the British soldier shot by the Turks while he was serving with the UN in Cyprus in 1996 He had extensive soft tissue injury and vascular compromise of his buttock and thigh, and after aeromedivac there was grave concern about the viability of his limb girdle musculature. After hyperbaric oxygen (HBO) and appropriate surgery his condition stabilised and he has made a good recovery *(See Note)* HBO was also employed successfully as an adjunct to surgery in the cases of two other soldiers one with a threatened limb due to compartment syndrome and another with a compromised skin graft over a compound lower leg fracture The efficacy of HBO for acute ischaemic conditions such as those described is well recognised in North America and Continental Europe but hitherto it has rarely been available in Britain HBO is now known to antagonise the ill effects of ischaemia reperfusion (IR) injury and the judicious and timely use of HBO in the sorts of cases described above illustrates its value to the military surgeon

In addition to the hyperbaric treatment of some 20 diving accidents an Allied Navy Captain (serving in UK) and his wife were successfully treated for accidental carbon monoxide poisoning after transfer to the Unit from London And of 50 smoke inhalation or carbon monoxide poisoning victims eleven have required intensive care support in Haslar while undergoing HBO therapy. The specific referral of these challenging ITU cases to Haslar provides valuable experience of military relevance to Service practitioners while generating useful Extra Contractual Referral income for the DSCA

A major collaborative research study with the Royal Marsden Hospital will commence within weeks The trial will investigate the use of HBO in radiation nerve injury The study is funded through a grant to the charity Radiation Action Group Exposure (RAGE) from the National lottery It is expected to be a continuing source of positive media coverage for Haslar Additionally DERA have set aside funding to reinvest in a trial of HBO for soft tissue 'sport type' injuries accelerated recovery from these common training injuries would be of substantial benefit to the military Protocols are also in preparation to investigate the use of HBO for non union of fractures (+/ refractory osteomyelitis)—a topic of military relevance and also a study of perianal Crohn's disease is planned (this is a good model of chronic sepsis/inflammation) Both of these latter studies should attract external funding

Overall the HMU provides a valuable treatment modality of military relevance combined with a training function of both clinical and operational importance to the Defence Medical Services It gives RH Haslar a facility that other hospitals do not have at a time when it is increasingly difficult to identify positive differences between military medicine and secondary care provided by the National Health Service With imaginative and judicious management the HMU should flourish and prove a cost-effective asset to British military medicine

Note Clinical details of the soldier wounded in Cyprus are published with his written informed consent

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Clinical management

Telemedicine - 'toys for the boys' or an essential tool?

P J Buxton

Introduction

The definition of telemedicine as the use of information technology systems to bring together health care providers patients and relevant clinical data is widely accepted but with its high technology overtones belies the long history of this field From the earliest days of the telephone doctors have discussed cases and sought advice and today the telephone routinely enables doctors to describe cases to colleagues and to seek their advice The use of more complex equipment than the simple telephone to pass information should build on this experience and the technology used should be no more complex than that needed for the task in hand

In 1924 three years before the invention of television the magazine *Radio News* showed a child being examined at home by a remotely located physician using an interactive videoconferencing system In 1959 radiological examinations were transferred over a coaxial cable to a distant site for interpretation

Apart from a few pioneering sites which relied wholly or partly on research money there was little development until the ready availability of more powerful computers in the last 10 years This explosion of interest has centred largely on the USA where systems are in use to provide medical care to prisons remote populations and the military Other countries notably Sweden have played a large part in the development of teleradiology The use by aid agencies in Third World countries has been restricted by limitations in communication infrastructure The development by the United Nations of INMARSAT data protocols is aimed at overcoming these limitations by facilitating the use of satellite communications

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The Defence Secondary Care Agency (DSCA is committed to increasing the electron integration of its disparate sites and to seamless integration of a full electronic patient record visible at all sites This has the potential to provi the ultimate in telemedicine Each step on the ro to this goal must be justified both in economi terms and in benefits available to the patient Th requirements must be matched to the technolog and neither must not over engineered. Th clinical requirement must drive the technolog and not the other way around

This article seeks to describe the equipment a techniques used in teleradiology to describe wh telemedicine is performed at present in the DSC and to provide some ideas of what areas could b further developed. Teleradiology is used as a prime example not because other specialties ha no valid uses for the technology but because, a) is the most mature of the specialties b) it is one the most data intensive with little margin allowable image degradation and c) the natura affinity of the author

Techniques and equipment

There are two basic forms of telemedicine sto and forward and real time video teleconferenci (VTC) The former is best suited to t transmission of high resolution still images su as radiographic images or pathology slides which an opinion can be given and a report se The latter is suited to live interviews with patien and their referring clinician

The transmission of radiographs (teleradiolog and pathology slides (telepathology) is now widespread practice in the USA[2] and parts Scandinavia[3] and the technology is well prov with accepted imaging standards VTC and t transmission of additional still images and digi audio signals are less widely available but there increasing use between fixed sites in the US Pro of concept studies using VTC have also be

undertaken with deployed US forces in Bosnia and Somalia.

In a store and forward operation the image must first be captured in a digital format using either a camera, scanner or direct capture transmitted to the distant site and then displayed on a suitable monitor. In the VTC mode of operation there must be remote control video cameras at each site, large video monitors and ancillary equipment for specialist examinations such as electronic stethoscopes, dermascopes and document capture cameras.

The sites are connected by telephone lines of varying sophistication. The rate at which data can be transmitted is dependent upon the bandwidth and is measured in bits per second. Store and forward systems do not require as high a bandwidth as VTC and some teleradiology systems work satisfactorily on standard telephone lines. The use of higher bandwidth Integrated Service Digital Network (ISDN) lines is preferred as these offer much higher transmission speeds. If VTC is to be successful it requires very high bandwidth either multiplexed ISDN lines or T1/E4 lines and these are considerably more expensive than standard telephone lines. One major problem is that areas most in need of a telemedicine service are the least likely to have high grade telecommunication links. To overcome this the use of mobile satellite communication equipment has been developed.

The amount of data contained in a standard radiographic immense. A single digitised standard chest radiograph corresponds to a file size of between 8 and 10 Mbs (roughly equivalent to 5000 typed sheets of A4). If this data was sent via a standard telephone line using a 28.8kb/s modem it would take 57 minutes and via an ISDN line approximately 8 minutes.

There are many techniques for compressing these files to remove redundant data but compression ratios above approximately 2:1 are irreversible and involve some loss of data. Artifacts related to the compression algorithm can become more prominent at higher ratios. The benefits however are in greatly reduced transmission times. The file described above that would take 57 minutes to transmit uncompressed would, if compressed 20:1 take 2.8 minutes. The teleradiology standards[4] promulgated by the American College of Radiology (ACR) do not specify the degree or type of compression that may be used but state that it is at the discretion of the radiologist and the images must be permanently annotated as compressed. This clinical control of the image standard is analogous to the routine quality [illegible] based [illegible]

Present and future uses

The Radiology Department at Royal Hospital Haslar has had the ability to transfer images to the local Neurosurgical Centre in South Hampshire for many years. Low resolution images are captured onto a personal computer (PC) and transmitted by ordinary telephone line. The images are not intended to be of diagnostic quality and their only use is as an aid in deciding the necessity and speed of transfer to the Neurosurgical Centre. This system has been of immense benefit in that enabled rapid decisions on management to be made and has largely eliminated the requirement to send films by courier.

Plans are now well advanced for teleradiology links from The Princess Mary's Hospital RAF Akrotiri and RNH Gibraltar to RH Haslar. The quality of images transferred with this system will be much higher than that used in the system described above. It is intended that diagnostic reports could be made on these images and that this could reduce the need to send hard copy films to the UK for reporting.

The file transfer system at the heart of a teleradiology system can also be harnessed to provide a form of telemedicine for other specialties. If an image or sound file can be captured electronically using a colour camera and electronic stethoscope it can then be transferred to a remote site using the teleradiology software. Although such a system would only provide a store and forward system and the user interface would not be specifically designed for telemedicine the images would be of high quality and the usefulness of telemedicine could be assessed for little additional cost.

Such a system could be used in a ship since the communication hardware and power supplies would be available. The limitations to its use are likely to result from the physical size of the equipment whilst a laptop PC could easily cope with the software, the attached peripherals particularly high resolution radiographic film digitisers are fairly bulky. It might be more practical to use a simple multipurpose digital camera to photograph the radiograph, skin lesion or ECG and accept a reduced resolution as an acceptable price to pay for usability.

The recent development at by the US Department of Defense of an ultrasound machine capable of acquiring a 3 dimensional data set has opened up new and exciting possibilities for remote diagnosis of ultrasound images. The machine in

the field [illegible] operated by an untrained assistant who places a small probe on the patient and the machine then acquires the ultrasound data automatically. This data is then sent using a store and forward protocol to the base hospital. A radiologist uses a virtual ultrasound probe to examine the reconstructed data in any plane. Such a system overcomes the inadvisability of interpreting static ultrasound images and because the data is not sent in real time the communication link does not require a high bandwidth.

Electronic storage of all radiographic examinations at RH Haslar is planned to produce a filmless environment. This Picture Archiving and Communication System (PACS) could use developing computer networks between the DSCA sites to transfer images. This could be of great value in those areas where RH Haslar provides the majority of the investigations such as MRI.

Clinical and economic justification

The provision of telemedical facilities must be based on sound clinical and economic reasoning. It is beyond the scope of this article to provide a full justification for such systems but some initial criteria can be laid down:

a. There must be a genuine clinical requirement.
b. The image quality must match the clinical requirement.
c. The technology must be no more complicated than is necessary.
d. The hardware must be rugged enough for the expected conditions.
e. The value of it in reducing the number of casevacs could be estimated based on US experience.
f. Timely reporting of radiographs from foreign hospitals might only be achievable with teleradiology.

There is a great deal of pressure being applied by manufacturers and telecommunication companies for the adoption of telemedicine. Many communication companies have found they have a great deal of spare capacity and these applications are seen as a way of absorbing this excess.

In addition to guarding against external pressures we must be wary of internally generated pressures. This might arise from unrealistic clinical or managerial expectations of the systems. For example a teleradiology link between Cyprus and RH Haslar could increase the speed of report provision but it may not be possible for all films to be sent if the communication links are too slow.

The concept of mentoring has also recently considerable publicity. Even if the technology were mature enough, which it is not at present, might not be considered either practical advisable to allow an inexperienced surgeon Medical Assistant to attempt an unfamiliar procedure if his only guidance was from the virtual presence of a consultant at a remote site.

Conclusion

Teleradiology is the most mature of the telemedicine disciplines and it is in regular clinical use throughout the world. If other disciplines are to follow its lead then they too must develop technical requirement standards justify the requirement for the provision of the system and prove by experimentation that the system is acceptable. There are however many specialties that could benefit from the transmission of still images to supplement verbal case discussions.

These store and forward systems can now be considered mature enough in both software development hardware capability telecommunication requirements and equipment costs to be capable of performing a useful function in the routine clinical setting. Conversely VTC has yet to prove its value. The equipment is vastly more expensive the communication requirements are many times greater and it has no clear place in the routine clinical setting.

Telemedicine systems may well have a place in supporting the dispersed assets of the DSCA in both peace and war but each case must be based on rigorous clinical requirement and the equipment must be capable of performing to an acceptable standard. The technical capability of modern equipment is staggering but it must remain the tool of clinical practice not its driving force.

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Research

The Mortality of Royal Naval Submariners 1960–1989

Hazel Inskip

Abstract

The mortality pattern of 15 398 Royal Naval submariners has been examined to assess the long term health of personnel engaging in submarine. The main outcome measures used were standardised mortality ratios (SMRs) which represent the submariners mortality rates as a percentage of the rates in England and Wales. The SMR for all causes of death combined was 88 (not significantly different from 100) which is similar to findings in other studies of Armed Forces personnel. Cancer mortality was particularly low with an SMR of 69 and there was a particular cancer site which showed an excess. Raised mortality from digestive disease was seen (the excess is attributable to cirrhosis). The study which gave rise to an SMR of 204 based on 17 deaths, all but one a contributory factor in eight. This excess mortality from cirrhosis was concentrated in the period 1970–79. Those recruited in men who had left the Royal Navy. Deaths from accidents and violence were also higher than expected with an SMR of 115 but this was due to high levels of accidents during after discharge, from the Navy

Introduction

Submariners are exposed to a carefully monitored and artificial atmosphere and some are also exposed to ionising radiation. Short term effects on health are monitored though in general submariners are a healthy group. A study of morbidity rates during 1969–74 showed that for most diseases the sickness admission and disease incidence rates for submariners were statistically significantly lower than those for non-submariners within the Royal Navy. Such a study however gives no information about the long term effects on health which may only become apparent after the submariners have left the Navy. To assess this Royal Navy personnel who first underwent training for submarine work between 1960 and 1979 have been followed up to the end of 1989 and their mortality pattern examined. A more detailed report of this study has been published elsewhere.

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At the outset it was felt that any excess of death from any particular cancer would be noteworthy though the main emphasis was on cancers of the lung as these might be related to atmospheric constituents in the submarine. The atmospheres of diesel and nuclear submarines differ mainly because diesel submarines have to ventilate daily to recharge their batteries. Nuclear submarines in contrast can remain submerged for long periods and the atmosphere is recycled.[1] Radiation exposures have been minimal at sea even in the early days of nuclear submarines. Exposures do occur however during maintenance and repair work within the reactor compartment.[2] For in my nuclear submariners radiation exposure is lower than that from natural background radiation as they are protected against the effect of cosmic rays while submerged.

During the study period both diesel and nuclear submarines were in use in the Royal Navy. This study does not distinguish between the two types of submarine service some submariners having served in both types. Extracting the details of individual patrols for each submariner would have been in extremely complex task. It was felt that this could be explored further should excesses of any particular cause of death arise in the whole study population.

Methods

Study Population

No lists of submariners for the period of interest existed in the Royal Navy and so study participants were identified from the Submarine Escape Training Tank (SETT) records held at HMS *Dolphin*. All Naval personnel who serve in submarines must undergo training at the escape tank and this has to be repeated periodically by active submariners. The SETT records for Royal Naval personnel contained the name and date of training and for most men the service number was also recorded. Prior to 1972 officers were not issued

with service numbers. Records also existed for members of foreign navies and civilians who underwent training at HMS *Dolphin*. To identify which of these records referred to Royal Naval submariners and to obtain the information required for long term follow up of study members the Royal Navy personnel records at HMS *Centurion* were consulted and full identification details were obtained.

The study received ethical approval from the British Medical Association Ethics Committee. All data relating to individuals were kept in locked filing cabinets within the MRC Environmental Epidemiology Unit which is registered under the Data Protection Act for conducting research of this nature.

Follow up

All submariners who were in service on 31 December 1989 were assumed to be alive on that date. The details of all those who had been discharged prior to this date were sent to the National Health Service Central Register (NHSCR) to obtain information on whether the individuals were alive, dead, emigrated or untraced. Death certificates were obtained for those who had died and causes of death were coded according to the ninth revision of the International Classification of Diseases (ICD)[6] by the Office of Population Censuses and Surveys (OPCS).

As the Armed Forces have their own medical service which is not part of the National Health Service, forces personnel are not actively registered in the NHSCR during their period of service. Therefore information about mortality occurring within the forces is not complete in that register. In order to identify deaths occurring in service, the records of all deaths occurring in the Royal Navy were extracted from the registers and put onto computer. This file was then linked to the file of submariners by name and service number to identify the in service deaths in the cohort. The details of the deaths about which no information had been received from the NHSCR were extracted and efforts were made by the NHSCR to locate a death certificate. Where this was impossible the causes of death as described in the Naval medical records were coded by the OPCS.

The Royal Navy's death registers were only available from 1966. In order to ensure that earlier deaths were not missed, the Naval medical records were examined for each submariner in the study who had left the Navy prior to 1966 and for whom there was no tracing information available after they left the Navy.

In limited circumstances such as for medical research purposes the Department of Social Security (DSS) can also provide help with tracing when National Insurance numbers are available. It was thus possible to trace a further 496 people who were otherwise untraced or for whom no trace could be found at the NHSCR beyond their periods of service in the Navy. The DSS provided information about whether each person was alive or dead and dates of death where appropriate. Once the dates were available, some of the causes of death could be found in the NHSCR.

Statistical methods

Standard methods of analysis for cohort studies were used to compare the mortality of submariners with that of men in England and Wales.[7] Person years at risk were calculated for the entire study population with the date of entry to the study for each submariner being the date of his first SETT record. Since those to service on 31 December 1989 were not followed up, person years for the study population were not calculated beyond this date. Expected numbers of deaths from all causes and various specific causes were calculated by multiplying the person years at-risk in five year age groups and calendar periods by the appropriate rates for males in England and Wales. Ratios of the observed to expected deaths were calculated to give standardised mortality ratios (SMRs) which were expressed as a percentage. Thus an SMR of 100 would mean that the mortality of this group of submariners was the same that of males in England and Wales. Ninety five percent confidence intervals (CIs) were calculated using tables of the Poisson distribution.

In analysing the mortality from specific neoplasms the latent periods between initiation of the tumours and death were taken into account. Latent periods vary with cancer site and can be as long as 25 to 30 years. It is impossible to examine such long latent periods in a study which only spans 30 years but to take some account of latency three analyses were conducted in which two, five and ten years respectively were allowed to elapse before starting to count the person years at risk and the numbers of deaths.

Results

Study population

A total of 15 138 submariners were identified as satisfying the conditions for entry to the study and providing some information on follow up after their SETT training. On 31 December 1989 3 5 of the submariners were still serving in the Navy and so were known to be alive on that date.

Between 1960 and 1989 340 submariners died, of whom 109 died in service. No cause of death was

available for 28 of the deaths mainly because the death occurred abroad or the body was never found.

Mortality

The SMRs for broad groups of causes of death and several specific causes are presented in *Table 1*. The SMR for all causes was 86 while the SMRs for circulatory diseases and all malignant neoplasms were still lower at 65 and 69 respectively. Among broad cause groups the SMR for respiratory causes was particularly low at 28. The SMRs for all specific types of neoplasm with more than two deaths and accidental causes of interest are also given in *Table 1*.

No trends were apparent in any of the major cause groups by calendar period or time since leaving submarine service. Analyses of cancer mortality allowing for latent periods of two, five or ten years showed no excess from any site.

There were more deaths from digestive diseases than expected giving an SMR of 165 (95% CI 99–261). The excess was entirely explained by the 12 deaths from cirrhosis of the liver seven of which had alcohol specifically mentioned on the death certificate. Three men who died from cirrhosis were noted in the Naval medical records as having been heavy drinkers or alcoholics but for one of these, alcohol was not mentioned on the death certificate. Two others were noted as having had accidents following a drinking session and both of these had alcohol mentioned on their death certificates. Others may have been drinkers, but the fact went unreported in the records because it did not come to medical attention while they were in service. Comparison of the 12 cirrhotic deaths with the 5.4 expected on the basis of English and Welsh rates gave an SMR of 221 (95% CI 114–387) for this cause. This excess was concentrated in the period 1970-79 for which the SMR was 729 (95% CI 268–1587) based on six deaths. The remaining six deaths from this cause all

Table 1 Numbers of observed deaths, standardised mortality ratios and 95% confidence intervals for selected causes of death

Cause (ICD 9th revision codes)	Obs	SMR	(95% CI)
All malignant neoplasms (140-208)	56	69	(52–89)
Cancer of			
oesophagus (150)	3	127	(26–370)
stomach (151)	5	113	(37–264)
colon (153)	5	181	(33–236)
pancreas (157)	4	136	(37–349)
lung (162 164)	10	62	(30–114)
skin (191 192)	3	38	(8–114)
Melanoma (172)	4	135	(36–366)
Non Hodgkins Lymphome (200 202.0 202.1 202.8)	3	65	(13–190)
leukaemia (204-208)	5	74	(24–173)
Endocrine, nutritional and metabolic diseases (240-279)	3	44	(9–130)
Circulatory diseases (390-459)	71	65	(51–82)
Respiratory diseases (460-519)	5	28	(9–65)
Digestive diseases (008-009 520-575)	18	165	(98–95)
cirrhosis of liver (571)	12	221	(114–95)
Accidents and violence (E800-E999)	153	115	(98–135)
Motor vehicle traffic accidents (E810-E819)	58	118	(90–153)
Water transport accidents (E830-E838)	2	129	(16–464)
Accidental poisoning (E850-E869)	6	101	(37–221)
Accidental poisoning by alcohol (E860)	4	417	(114–1068)
Accidental falls (E880-E888)	7	109	(44–224)
Accidental drowning (E910)	10	326	(156–599)
Suicide (E950-E959)	34	98	(68–137)
Homicide (E960-E969)	1	32	(1–180)
Injury undetermined whether accidentally or purposely inflicted (E980-E989)	11	96	(48–171)
All causes (000-999)	340	86	(77–95)

occurred in the period 1980-89 but this number was much closer to that expected from national rates, with the SMR being 133 (95% CI 49-289).

Deaths from accidents and violence were slightly higher than expected with an SMR of 115 (95% CI 98-135). The largest single cause of accidental death was due to motor vehicle traffic accidents with an SMR of 118 (95% CI 90-153). The next largest cause was suicide with an SMR of 98. A threefold excess of deaths from accidental drowning was apparent and deaths from accidental poisoning by alcohol were four times higher than expected, though there were only four deaths from this cause.

Results of the analysis of mortality in service and after leaving the Navy are presented in *Tables* 2 and 3. For 104 submariners no date of leaving the Navy was found in the records although it was known that they had left prior to the end of 1989 so they had to be excluded from these analyses.

Mortality was particularly low during service in the Navy with the SMR for all causes being 69. After leaving the Navy all cause mortality rates were close to the national average for males with an SMR of 96, but accidental and violent deaths were particularly high with an SMR of 131 (95% CI 104-163). The excess mortality from cirrhosis of the liver occurred in men who had left the Navy.

Discussion

All Cause Mortality

The SMR of 86 recorded for submariners is broadly in line with those reported for many occupational groups[5] and, in particular for other Armed Forces personnel[6, 7] for whom the SMR ranged from 79 to 87 in different time periods. Such low SMRs are commonly found in occupational groups as they exhibit what is known as the 'healthy worker effect'.[8] A strong healthy worker effect would be expected in submariners

Table 2 In service mortality: numbers of observed deaths, standardised mortality ratios and 95% confidence intervals for selected causes of death

Cause (ICD 9th revision codes)	*Obs*	*SMR*	*(95% C*
All malignant neoplasms	9	35	(15–66
Cancer of			
Oesophagus	1	213	(5–1190
Stomach	2	167	(23–60
Colon	0	0	(0–28
Pancreas	1	155	(4–86
Lung	0	0	(0–35
Brain	1	35	(1–19
Melanoma	0	0	(0–35
Non Hodgkin's lymphoma	2	112	(14–40
Leukaemia	0	0	(0–111
Endocrine, nutritional and metabolic diseases	1	40	(1–22
Circulatory diseases	13	46	(25–7
Respiratory diseases	3	28	(6–11
Digestive diseases	2	61	(7–22
Cirrhosis of liver	0	0	(0–25
Accidents and violence	73	101	(79–12
Motor vehicle traffic accidents	37	119	(84–16
Water transport accidents	0	0	(0–38
Accidental poisoning	4	133	(36–34
Accidental poisoning by alcohol	2	558	(67–201
Accidental falls	2	64	(8–2
Accidental drowning	7	378	(152–77
Suicide	12	74	(38–12
Homicide	0	0	(0–22
Injury undetermined whether accidentally or purposely inflicted	0	0	(0–7
All causes	109	69	(57–8

Table 5. Mortality after leaving the Navy: numbers of observed deaths, standardised mortality ratios and 95% confidence intervals for selected causes of death

Cause (ICD 9th revision codes)	*Obs*	*SMR*	*(95% CI)*
All malignant neoplasms	45	86	(62–114)
Cancer of			
Oesophagus	2	111	(14–402)
Stomach	3	95	(20–279)
Colon	4	115	(31–294)
Pancreas	2	82	(11–333)
Lung	10	84	(40–154)
Brain	2	43	(5–156)
Melanoma	4	222	(61–569)
Non Hodgkin's lymphoma	1	36	(1–202)
Leukaemia	5	144	(47–335)
Endocrine, nutritional and metabolic diseases	2	43	(61 175)
Circulatory diseases	55	72	(54–94)
Respiratory diseases	2	20	(2 72)
Digestive diseases	14	189	(103–317)
Cirrhosis of liver	10	258	(124–474)
Accidents and violence	78	131	(104–163)
Motor vehicle traffic accidents	21	119	(74–182)
Water transport accidents	2	331	(40–1194)
Accidental poisoning	2	70	(9–253)
Accidental poisoning by alcohol	2	339	(41 1223)
Accidental falls	5	154	(50–359)
Accidental drowning	3	252	(152–736)
Suicide	22	121	(76–182)
Homicide	1	70	(2 393)
Injury undetermined whether accidentally or purposely inflicted	10	158	(76–291)
All causes	220	95	(84–110)

ality are selected on health grounds. Not surprisingly therefore, mortality in those serving in the Navy was particularly low with an SMR of 69. But after discharge mortality rates were close to those for England and Wales. The SMRs reported here are however somewhat higher than the SMR of 62 found for submariners in the United States when compared with the US male population [4].

Mortality from specific causes

When considering analyses of specific causes of death the inaccuracies that can occur on death certificates must be borne in mind [15]. Death information was obtained from two sources namely the NHSCR and the Navy death records, and this may have caused a bias when comparing with deaths recorded in England and Wales. For only four deaths was the cause of death obtained solely from Navy death records rather than from an official death certificate. Some deaths occurred abroad but it is not clear how many would have featured in the national rates against which comparisons have been made in this study. It is possible that biases in the cause specific mortality ratios have arisen as a result of information being drawn from more than one source.

The particularly low mortality from respiratory disease is likely to be a real effect which can be explained by selection on health grounds: those with respiratory problems are not allowed into the submarine service. Cancer mortality is thought to be less affected by selection so the all cancer SMR of 69 observed here is remarkably low. With this SMR being lower than that for all causes and comparable to that for circulatory disease it is apparent that during the period under study the submarine environment did not increase the risk of cancer. It is noteworthy that the results for mortality from all cancers and cardiovascular disease were similar to the findings of a study of

[illegible] ch the SMRs were about 70 for both causes. However as the present study only had an average follow up of 18 years the possibility of excess cancers with long latent periods cannot be ruled out.

Although the power was low for examining particular cancer sites, there was no evidence of excesses of any specific cancers within the follow up period. Notably deficits of lung cancers and leukaemia were observed and these are malignancies which might have been associated with exposures that occur in the internal submarine environment such as radiation. Nuclear submariners generally have low radiation exposures and indeed due to the protection from cosmic rays some may have lower exposures than the general population. This is unlikely to explain the cancer deficits but the lack of excesses is certainly encouraging. Sadly of course no specific information was available on exposure of individuals either to terms of duration of time at sea, or to specific carcinogens. However if some aspect of the submarine service had given rise to an increase in cancer the effect must either have been very small or the submariners with low exposures must have had remarkably low cancer mortality.

The high mortality from cirrhosis of the liver is of some concern but it is most unlikely to be related to the submarine environment. Among the twelve men who died from this cause eight had alcohol mentioned on their death certificates or were noted in the Naval medical records as having been heavy drinkers or alcoholics. Thus it appears that alcohol was a factor in the majority of deaths from this cause. Excess mortality from diseases related to alcohol including cirrhosis of the liver was reported for Naval personnel within a study of mortality among United Kingdom servicemen who served abroad in the 1950s and 1960s.[3] An SMR of 129 was found when rates for England and Wales were used as the standard but the excess was almost seven-fold in comparison with rates for Army and Royal Air Force personnel. In that study it was suggested that the excess might be due to the duty free alcohol which is available to all members of the three services while abroad, and to provision of alcohol to Naval personnel. In the current study of submariners the excess was greatest in the decade 1970-79 and was hardly evident in the 1980s although there were six deaths from this cause in each period. Comparing the 1980s with the 1970s there were more person years at risk in the study population which was also older and thus at greater risk of cirrhosis. Between the early 1970s and the late 1980s the rates in the national population approximately doubled, but this is not sufficient to explain the difference in excess mortality in submariners between the two decades. It is worth noting however that death rates for this cause not only vary over time but also geographically rates in Scotland for example, are approximately double those in England and Wales and they too have doubled throughout the period of this study. This is of relevance as some submariners are from Scotland and some are based there. The encouraging point from this study is however that extrapolation of the decline in mortality from this cause in submariners between the 1970s and 1980s suggests that the disease is now of less concern in this group.

There were 28 deaths for which no cause could be assigned. Although they were included in the assessment of all cause mortality they could not feature in any of the cause-specific analyses. Three individuals who participated in the Falklands conflict were noted as missing presumed dead but although in the Navy they were not serving submariners at the time. There were six men for whom drowning was the likely cause as they fell overboard, but, because their bodies were never found the cause could not be ascertained. For one additional death the place of death was a highway and so it was probably a road traffic accident. For the remaining 18 deaths no information was available about the circumstance of death and for six of these the only source of the fact of death was the Department of Social Security records. The reason for no cause being given was because the death occurred abroad and only the date of death could be found.

With 10 of the deaths from unknown causes appearing to be accidental the SMR of 115 for accidents and violence is likely to be an underestimate. Even when considering these extra accidental deaths in the analysis the excess was confined to the period after the submariners left the Navy. This indicates that submarine service *per se* does not increase the risk of accidental or violent death. The only exception is accidental drowning from which there were seven deaths noted in service given that the population are at sea, this comes as no surprise.

There is no obvious explanation of the excess after discharge from the Navy though risk taking may have increased when people were freed from the discipline of the services and as for cirrhosis of the liver alcohol may have played a role. Deaths (but only four) from accidental poisoning by alcohol did, however occur both in service and after discharge. Accidents comprised the largest specific cause group by far which is not surprising in a young cohort but it is of concern that when the

submariners returned to civilian life their mortality from this cause was significantly higher than for the rest of the civilian population. The excess mortality from accidents and violence in ex-submariners could not be attributed to one type of accident alone. The majority of these deaths were due to traffic accidents and suicide, both SMRs being elevated but only slightly over 100. There were only small numbers of deaths from other specific types of accidents but *Table 3* presents a pattern of elevated mortality from a broad spectrum of accidental causes.

Possible biases

An assessment of the possible biases inherent in this study has been described elsewhere. In addition to the usual problems faced when analysing data from death certificates there is always concern that deaths may have been missed. It has been shown that the number of missed deaths is unlikely to exceed 10 and therefore the various SMRs are unlikely to have been seriously underestimated.

Conclusion

The submariners in this study appeared to be a healthy group of individuals who experienced low mortality when compared with men in England and Wales. There was no evidence that submarine work led to an increase in mortality from cancer of any site and there was a deficit of cancer deaths in submariners when compared with the national population. The high mortality from cirrhosis of the liver in the 1970s had declined markedly by the 1980s relative to rates in the civilian population of England and Wales. Deaths from accidents and violence were also somewhat higher than expected but the excess occurred amongst those who had left the Navy.

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A full report of this study has been published in the journal *Occupational and Environmental Medicine*[2].

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Prevention of Heat Strain by Immersing the Hands and Forearms in Water

J R House, Cathy Holmes and A J Allsopp

Abstract

The effectiveness of hand immersion (water at 10°C, 20°C and 30°C) as a technique for reducing heat strain in Royal Navy (RN) personnel has been investigated at the Institute of Naval Medicine (INM). Four subjects exercised at a moderate work rate whilst wearing fire fighting clothing in an environmental chamber at 40°C. The subjects reached heat strain safety limits within 45 minutes of commencing work at which point they rested in the heat for 30 minutes whilst they underwent one of four experimental recovery regimens: (1) no intervention (free recovery), (2) hands immersed in water at 10°C, 20°C, or 30°C. The experiment was repeated on further three days so that the subjects undertook each experimental condition in a balanced randomised order. During the control condition without hand immersion the subjects were unable to exercise for a further 30 minutes. If the hands in water (at 10°C, 20°C or 30°C) significantly (P<0.05) lowered body core (auditory canal) temperature within ten minutes. Assessing the effectiveness of this technique by the initial rates of core temperature reduction revealed that immersion of the hands was more effective the cooler the water. Following 30 minutes of hand immersion, mean core temperature had dropped from 38.5°C (sd 36.9) (standard deviation 0.19) (C 37.3(0.18)) C and 37.8(0.10) C in 10°C 20°C and 30°C water respectively. Cooling powers estimated from changes in mean body temperature were 334, 307 and 113 watts using 10°C, 20°C and 30°C water respectively. These results indicate that hand immersion in water at a temperature between 10°C and 30°C is an efficient means of cooling heat stressed personnel who have been exercising. This simple and effective technique may be applied in many industrial and military tasks to reduce heat strain, lower the risk of heat injury and increase safe, total work times in the heat. For the RN, hand immersion could be used in fire fighting damage control and NBC operations where personnel alternately work and rest.

Introduction

Exposure to heat or increased metabolic heat production through physical work will increase the heat content of the body. This is usually balanced by heat loss mechanisms, primarily sweating, as a result of which body temperature is kept within safe limits. Evaporative heat loss is impaired when wearing impermeable or semi-permeable protective clothing. Under these circumstances, unless sufficient heat can be dissipated by the processes of conduction, convection and radiation, heat stroke or heat exhaustion will ensue, with consequences which may be life threatening. Heat strain was most recently reported to reduce Royal Navy (RN) operational effectiveness when at risk of missile/NBC attack in the Persian Gulf during Operation GRANBY[1].

Previous Institute of Naval Medicine (INM) research has attempted to quantify the likely useful work endurance of personnel in RN protective clothing and to advise upon the duration of rest periods to allow adequate body cooling[2,3]. When at rest, cooling may occur only slowly or not at all[4,5] and thus attention has been given to methods of actively cooling. One such method, that of limb immersion in cool water, has been suggested[6] and explored in earlier studies by others[7] and at this laboratory[8,9]. These previous studies of hand immersion indicate that the technique can be used to cool personnel suffering heat strain.

Hand immersion, similarly to many other cooling techniques, requires a good peripheral blood flow which carries heat from the body core to the skin then to be radiated, convected or conducted away. If peripheral blood flow is diminished the amount of cooling possible is reduced if it ceases the core becomes essentially insulated from the skin which is subsequently supplied with heat only by slow conduction through the tissues rather than rapid transport in the blood and heat loss is greatly reduced. In the extremities blood flow is primarily controlled by the arteriovenous anastomoses (AVAs), small contractile vessels interconnecting the small arteries with the veins thereby bypassing the capillary bed. The AVAs are thought to be centrally controlled under the influence of both core and skin temperature receptors although core temperature appears to be the dominant factor[10,11]. Hence if a normothermic individual were to immerse their hands in cool water, peripheral vasoconstriction

At the time of writing, all authors were working at the Institute of Naval Medicine

uld close the AVAs and prevent heat loss
nversely if the same individual was
perthermic then the AVAs would remain dilated
d allow conduction of heat at a rate proportional
Blood flow and the temperature gradient
tween water and blood The extremities would
pear to be a good site for conductive heat transfer
they have a greater capillary density and
gional blood flow than the torso[11] which is the
e most commonly cooled Past research has not
ovided definitive advice regarding the most
ficient water temperature for body cooling
uch should be that which provides the greatest
rmal gradient for heat conduction without
mpromising peripheral blood flow

im

he purpose of this present study was to determine
e most effective water temperature for hand
mersion to cool RN personnel suffering heat
rain It was hypothesised that peripheral
isoconstriction normally associated with limb
mersion in cold water does not occur when core
mperature is raised following exercise-induced
at strain, and secondly that more cooling will
cur with colder water

lethods

he experimental protocol was approved by the
foD(N) Personnel Research Ethical Committee
ior to subject recruitment The terms and units
ed in this study are according to ISO
andards[34 35] Four medically fit male volunteers
ed between 21 and 32 years gave their written
formed consent to participate The experiment
as a within subject balanced crossover design
th four conditions in which each subject whilst
periencing heat strain undertook hand
mersion in 10°C water 20°C 30°C and a
ntrol (no cooling) Heat strain was achieved by
using the subjects in heavy RN fire fighters
thing and exercising them in an environmental
amber at a temperature of 40°C dry bulb 29 5°C
et bulb 50% RH (Wet Bulb Globe Temperature
BGT 33°C) The exercise comprised stepping to
eight of 22 5cm at 12 complete steps a minute
metabolic work rate of approximately 310
atts[6 17] The subjects worked until their core
mperature reached 38 5°C and were then seated
d rested in the heat for 30 minutes according to
e experimental condition in the three immersion
nditions the un gloved hands were immersed in
after to a level just above the wrist in a
rmostatic water bath maintained at 10 20 or
°C Drinking water was freely available and
bjects were actively encouraged to drink

Experimental measures

Core (auditory canal t_{ac}) and skin (t_s) temperatures were measured using thermistors and the data logged electronically every minute T_{sk} was measured at five sites chest, upper arm thigh shin and distal phalange of the forefinger Electrocardiograms were displayed to allow continual safety monitoring Other indicators of heat strain were calculated from standard equations mean skin temperature (t_{sk})[18] mean body temperature (t_b) [9] heat storage[36] and rate of change of heat storage (heating or cooling) (S) T_{ac} at 10 20 and 30 minutes of rest, and the rates of change of t_{ac} between 0 10 10-20 and 20 30 minutes of rest were examined by analysis of variance to assess differences between the four experimental conditions

Although peripheral blood flow was not measured changes were inferred from alterations in the temperature difference between immersed skin and the water if this were reduced then it was assumed to have occurred because of less heat transfer from the core as a result of a fall in peripheral blood flow The difference between skin and water temperatures will determine the rate of cooling and will hereafter be described as the cooling gradient

Results

The subjects t_{ac} reached 38 5°C within 45 minutes of commencing work in all conditions before being rested in the heat All subjects completed the hand immersion conditions although only two subjects managed to rest in the heat in the control condition for the full 30 minutes the other two were removed by the Independent Medical Officer after 10 and 13 minutes These subjects were hyperventilating and clearly distressed even though all physiological measures were within the limits specified in the approved protocol Unless stated otherwise mean results are given using data from all four subjects with the standard deviation in brackets All differences stated are at the 5% significance level ($P<0.05$)

Mean water temperatures achieved were 12 3 18 9°C and 30 1°C In all subjects t_{ac} was maintained close to 38 5°C in the control condition and was reduced in all hand immersion conditions After 10 minutes of rest mean t_{ac} had not reduced in the control condition (38 5(standard deviation 0 1)°C) but had fallen in the 10 20 and 30°C immersion conditions to 37 5(0 1)°C 37 8(0 1)°C and 38 1(0 1)°C respectively After 20 minutes only two of the control subjects remained, their t_{ac} were 38 7°C and 38 4°C whilst in the 10 20 and 30°C

immersion conditions the t_{ac} were 37·0(0·1)°C 37·3(0·2)°C and 37·8(0·1)C respectively During hand immersion, the lower the water temperature the lower the value of t_{ac} following 10 or 20 minutes After 30 minutes t_{ac} in the 10C and 20°C conditions were similar at 36·9(0·3)°C and 37·0(0·2)°C whilst that for the 30°C immersion conditions was higher at 37·7(0·1)°C

A graph of mean t_{ac} during the rest period for each condition is shown in *Figure* 1 In each hand immersion condition, the rate of cooling was exponentially as t_{ac} fell During hand immersion in 10 and 20°C water the rate of decrease of t_{ac} fell to zero (i e reached a plateau as judged by eye) after 26 and 32 minutes respectively when normothermia was attained A plateau was not reached in any of the 30°C hand immersions The mean cooling rates are shown in *Table* 1

In the first 10 minutes the cooling power was greater with a lower water temperature In the second 10 minute period there were no significant differences in the cooling powers dependent upon water temperature Over the whole 20 minute cooling period 10 and 20°C water cooled the subjects more rapidly than 30°C water

At the start of each hand immersion condition the cooling gradient (the temperature difference between skin and water) was 7·6 7·2 and 2·6°C for 10 20 and 30°C water respectively This was maintained over the whole immersion period for the 30°C immersion condition but was steadily reduced during the 10°C and 20°C conditions For the 10°C immersion condition the reduction in the cooling gradient is plotted with t_{ac} and this is shown in *Figure* 2 During the first five minutes of hand immersion the reduction in the cooling gradient is similar to the fall in t_{ac} Between six and 18 minutes the reduction in the cooling gradient was between 0·2°C and 1·1°C greater than the fall in t_{ac} as a direct result of an increase in the immersion water temperature due to heat transfer from the hands After 18 minutes there was a large decrease in the gradient for cooling whilst as a result of a large fall in skin temperature t_{ac} fell only slightly

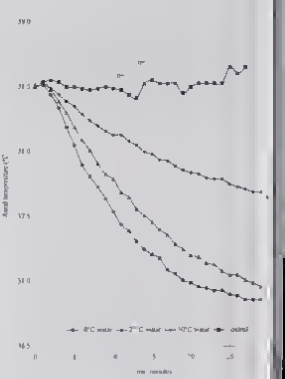


Figure 1 Change in core temperature (t_{ac}) of hyperthermic subjects during hand immersion in water at 10 20 and 30°C and a control condition (n=4)

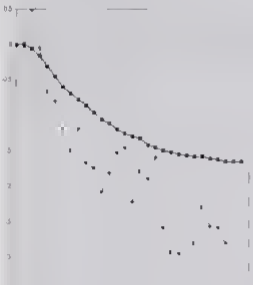
DISCUSSION

Hand immersion in cool water reduced heat strain quickly and effectively in resting heat stressed subjects otherwise unable to cool It would appear that peripheral vasoconstriction did not occur during immersion even in the coldest water as judged by the initial rates of fall of t_{ac} Direct measurement of peripheral blood flow by Doppler techniques during cold water hand immersion in hyperthermic subjects has subsequently confirmed this conclusion [1]

Table 1 Mean cooling powers during the first and second ten minute periods of rest for each condition (n=

Condition (temperatures) indicate hand immersion	Mean cooling power (watts)		
	0-10 minutes	10-20 minutes	0-20 minutes
10°C	433	234	334
20°C	318	296	307
30°C	134	91	113
Control	–48	–57(n=2)	–53(n=2)

Note a negative value is a rate of body heat storage.



gure 2 Reduction in mean core temperature (t_{co}) and an cooling gradient during hand immersion in 10C water -4)

The colder the water the faster the rate of ohng achieved This finding is in agreement th previous work in which the hands were ived[7,8] Wearing gloves provides insulation tween the hands and the water and whilst this ould have reduced the effieiency of heat fraction they might have been necessary to event the skin from reaching a temperature cold ough to result in peripheral vasoconstriction If npheral vasoconstriction occurred then this ethod of cooling would fail This study has own that when naked hands were immersed in ld water peripheral blood flow must have been intained when t_{co} was raised

lo this experiment the rate of cooling was minished as t_{co} fell during the latter stages of nd immersion The slower rate of cooling must ve been due to a reduced temperature gradient tween the water and the skin a reduced ripheral blood flow or both of these It is resting to note that the reduction of the thermal adient reflected that of t_{co} prior to normothermia ing attained This suggests that onnl normothermia was reached peripheral blood flow was maintained at a level sufficient to allow significant heat loss Once normothermia was achieved the further diminution of this gradient indicates that a reduction in peripheral blood flow must have occurred Hand immersion is thus a self limiting method of cooling in which the peripheral blood flow controls the amount of cooling dependent upon the core temperature

The cooling rates measured in this study (113 334 watts) calculated from changes in heat storage values over 20 minutes were 1 7 to 2 times greater than reported previously[5] this difference being attributable to the insulation of the gloves worn during immersion Other reported values[7] of approximately one-third than those found in the present study are thought to be lower because the subjects exercised during hand immersion this may have redistributed blood away from the skin to the working muscles[13] thereby reducing heat loss Furthermore in the previous study[7] the highest core (rectal) temperature attained at the start of cooling was only 37 7°C and hence the thermal gradient for heat loss was smaller

There are a variety of other active cooling methods such as liquid ice gas or air cooled garments Typical reported cooling powers for such systems are for ice vests 135 watts[22] and 142 watts[23] for liquid cooled vests 79-121 watts [24] 94 83 watts [5] and air cooled garments 77 197 watts[24] These values are much lower than that reported for hand immersion although the advantage is that these cooling garments can be used during work to attenuate the rate of rise of heat strain However because of the relatively low cooling power of active cooling systems better management of heat strain might be achieved by enforcing short rest periods in which the hands are immersed in cool water This was examined in a study at the FNM which compared the use of three different ice vests with hand immersion for RN firefighters who were exercising intermittently in a repeating work/rest cycle representative of a real incident The study found that the small attenuation in the rate of rise of t_{co} during work was more than compensated for using hand immersion in only 20°C water during rest

Hand immersion is subsequently recommended as the cooling method of choice

In conclusion this study found heat strain could be quickly and effectively alleviated by immersing the hands in 10°C and 20°C water with the 10°C water cooling at the faster rate This technique has been recommended to the Fleet as the most

appropriate method of cooling personnel in [illegible] heat illness.

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mesis research: a concise history of the ritical concepts and experiments

J Davis OBE

s profitable f r [illegible] that has a [illegible]

troduction

Vomiting is perhaps the most complex reflex response which makes extensive use of the antonomic and motor systems Involved in the reflex activity are salivation spasmodic respiratory movement effected by the antagonistic action of the inspiratory and expiratory musculature gastrointestinal reactions of a specialised nature and also postural characteristics of the head body and appendages typically adapted to the process of expulsion of the gastric contents In addition there are psychological and cardiovascular effects which fit into the total integrated response

So wrote, in 1980 Shih Chun Wang who in conjunction with Herbert Borison in 1950 had published the last major development in ideas concerning the mechanism of vomiting control hey suggested that an emetic chemosensory ceptor area existed that was separate from the called medullary vomiting centre (VC) and signated this the chemoreceptor trigger zone TZ) Their major review of the physiology and armacology of vomiting published in 1953 gan with the words

> The vomiting act is one of the most primitive functions with which animals are endowed The extreme variety of circumstances under which vomiting can occur defies description It may follow simple overeating or signal approaching death It often represents one of the chief signs of drug toxicity regardless of the route by which the drug is administered In spite of its universal appearance and great clinical importance the nervous mechanism of the vomiting act and the emetic action of many drugs are not well understood[1]

Despite the passage of 35 years since Wang and Borison's paper and the publication of five thousand scientific papers on this and related topics little had changed by the time the author began working in this area in 1983

Emesis constitutes a major complaint in a very large number of disorders that are created by virtue of physiological aberrations in pathological states The spectrum of problems that give rise to vomiting is very wide ranging from normal pregnancy[2] at one end to the bizarre psycho pathological aberration of stone vomiting at the other[3] The complications and consequences of vomiting may include dehydration sodium and potassium depletion metabolic alkalosis aspiration pneumonia Mallory Weiss syndrome Boerhaave's syndrome cachexia post surgical bleeding and post surgical wound disruption

Importantly it was noted on numerous occasions by clinical investigators that after one or more courses of treatment for malig nant tumours patients might refuse to continue with potentially life saving treatment because the side effects of nausea and vomiting had become intolerable[4,5] With increasing efficacy of therapeutic regimes for the control of malignancy such side effects looked like becoming the rate limiting step in treatment And yet at the meeting organised by the author in Oxford in 1984 entitled Nausea and Vomiting mechanisms and treatment reviews of the success rate of drugs against vomiting

the time of writing Surgeon Commander Davis was ointed to the Medical Countermeasures Centre Chemical Biological Defence Establishment Porton Down He has v resigned from the Royal Navy and lives in Wiltshire

[illegible] all causes showed that emesis remained relatively poorly amenable to pharmacological intervention

In practice it was the advent of highly potent but essentially toxic chemotherapeutic drugs like cisplatin that gave renewed impetus to emesis research. Despite its frequency (even before the emergence of agents like cisplatin and techniques like whole body irradiation) up until the 1960s treatment of vomiting was carried out largely on an empirical basis using drugs such as phenothiazines and antihistamines which had been shown to have an effect against gastrointestinal and vestibular based vomiting. The first controlled trial against chemotherapy induced nausea and vomiting was carried out in 1963 by Moertel and colleagues[3] comparing phenothiazines with placebo during the use of 5 fluorouracil a mildly emetic drug. Before 1977 chemotherapy induced nausea and vomiting received only scant attention with a meta total of six controlled therapeutic trials between 1963 and 1976[3]. With the appearance of novel cytotoxic agents and anti emetics like the cannabinoids and domperidone there was renewed interest in the area[4]. There was a similar paucity of experimental work on emetic mechanisms and apart from Borison's paper in 1958 on the site of action of mustine in the cat[10] it was not until the 1980s that attention was redirected to this area of experimental physiology and pharmacology. The history of clinical studies into radioemesis is similar but much more interest was shown in the mechanism of X radiation induced emesis starting with Borison's work in the cat[11].

A short history of research into the phenomenon of nausea and vomiting

The early days

The first recorded experimental work on nausea and vomiting appears to be that of Wepfer in 1679 who observed the closure of the pylorus and contraction of the pylorus part of the stomach during vomiting in cats dogs and even wolves[12]. Later in 1813 Magendie recounts in his Memoire sur le Vomissement an experiment in which a dog's stomach was replaced with a pig's bladder after which vomiting could still be induced[1]. It became accepted by the time that Magnus reviewed the literature in 1903[4] and Hatcher again in 1924[5] that there were at least two centres for vomiting one of which was automatic where apomorphine acted directly and the other a reflex centre. Gianuzzi in 1865[16] is credited with being the first worker to suggest the existence of a vomiting centre *per se* having made serious efforts to study the involvement of the CNS. Antimony sulphate induced vomiting in dogs [illegible] the late 1880s. Openchowski[17] and his pupil Hlasko[16] (quoted by Hatcher [5]) carried out a great deal of work and contended that there were independent centres for various acts concerned with vomiting with separate paths from each centre. Openchowski's failure to induce emesis in dogs with intragastric copper sulphate, after vagotomy also led him to the general conclusion that the vagi alone carried afferent emetic impulses from the stomach. It was Thiaucourt in 1891[9] who described a very small area (2 mm wide around the midline extending from 2 mm anterior to calamus scriptorius posteriorly for 5 mm through the obex) in the posterior part of the rhomboid fossa of the dog that was more sensitive than any other to the emetic apomorphine. When this area was destroyed apomorphine failed to cause vomiting.

In 1898 Cannon described the contribution of the various muscle groups to the act of vomiting and defined the basic mechanics.[2] These were later verified and expanded by Borison, Brizzee, McCarthy and others in the 1960s and 1970s[20].

Hatcher and Weiss confirmed and extended Thiaucourt's studies with apomorphine in the mid 1920s and prevented vomiting induced with either apomorphine or mercuric chloride by destroying the ala cinerea (dorsal sensory nucleus of the vagus i.e. the nucleus tractus solitarius).[5] Then in 1930 Koppanyi demonstrated in dogs with chronic lesions in the ala cinerea that the emetic sensitivity to parenteral apomorphine was reduced whereas irritant emetics (e.g. zinc or copper sulphate) remained effective by the oral route.[5] The hypothesis that the vomiting centre was in the ala cinerea was thus placed in doubt. As late as 1948 various textbooks of neuroanatomy described several different neural structures as the vomiting centre, for example the dorsal motor nucleus of the vagus or the nucleus of Roller. [illegible] these centres, however were postulated on the basis of a unitary concept that both the central and reflex emetic agents elicit vomiting by activating the same neural structure despite the evidence of Koppanyi.[5]

The modern era

Central mechanisms

Before 1948 investigations by Miller and Sherrington[6] and others had not been successful in obtaining emesis by electrical stimulation of the medulla oblongata. Having decided that barbiturate anaesthesia caused a general CNS depression this work was repeated by Borison and

ing in 1949[27] in the decerebrate cat and
miting was apparently readily observed during
se medullary stimulations so sobering in a
od of intense research and real progress in our
derstanding associated with such names as
ng Borison Brizzee and McCarthy In 1951
ng and Borison appeared to seal their concept
the vomiting centre as localized in the bulbar
icular formation when they showed that its
ruction resulted in a loss of the emetic
ponse to both central and peripheral emetic
uli[6] However in 1983 Miller and Wilson[29]
led to duplicate Wang and Borison's 1949
ctrical stimulation experiment and concluded
t a discrete vomiting centre did not exist
ling that the results of their experiments were
re consistent with the concept that neurones
olved in the control of vomiting are diffusely
mbined to the effective region described in
49 They suggested that electrical stimulation
ay be successful in eliciting emesis by direct
itation of descending pathways which could
oduce coordinated activation of the vomiting
sculature[9]
To address this conflict an alternative
ganizational model of this central control
stem was proposed by Davis Leslie Harding
d Andrews in 1984 based on the idea of
quential activation of the various effector nuclei
mprising the vomiting act In contrast to the
nventional view the vomiting centre was
visaged not as a discrete entity but a higher and
egrated function of these separate effector
cles (*Figure 1*)[21] Subsequently it has been
oncluded that a set of more or less diffuse
urones acting to coordinate the vomiting act (the
called central pattern generator for emesis)
y be located in the nucleus tractus solitarius
is proposal is particularly interesting in a
torical context as Hatcher and Weiss had
eady commented back in 1923[74] that "It
erefore seemed logical to look to the sensory
eleus of the vagus for the seat of the vomiting
flex
After their work on the vomiting centre
rison Wang and colleagues proceeded to carry
t superficial lesions of the caudal brainstem in
region of the ala cinerea in dogs which
sulted in abolition of the vomiting response to
omorphine and certain glycosides given
travenously By 1953 they published their now
ssic hypothesis that the chemoreceptor trigger
ne as the region had become known has a
ceptive not an integrative function and that it
mmunicates with the vomiting centre[2]
teresting this issue of the extent to which any
integration occurs within the area postrema is still
a matter of debate today Subsequently Borison
demonstrated the functional distinction between
the chemoreceptor trigger zone and the vomiting
centre[11] Borison and Wang[4] defined the
chemoreceptor trigger zone in the dog as a
bilateral structure less than 1 mm in size on either
side of the fourth ventricle contiguous medially
with the area postrema Based upon their
experimental studies they produced a diagram of
the organization of the emetic reflex (*Figure 2*) As
with the diagrams of the vomiting centre this
diagram has had an enormous influence on our
concept of the reflex and to some extent all
more recent organizational diagrams contain the
same elements (see *Figure 2*) Such organizational
diagrams are devoid of importance as they provide a
conceptual framework within which sites of
action of emetics and anti emetics are discussed

The elucidation of the neuronal connectivity of
the area postrema began with the recognition of
fibre connections between it and the subjacent
nucleus tractus solitarius[34 35] Physiological
evidence for a neuronal connection from the area
postrema to the vomiting centre was obtained by
Iwase *et al*[39] who elicited vomiting-like
behaviour in the dog by electrical stimulation of
the chemoreceptor trigger zone which earlier
studies by Borison and Wang and Miller and
Wilson were not able to detect By 1985 in his
review of the topic[8] Leslie was able to say that
noradrenaline adrenaline dopamine serotonin
and GABA had been localized in the area
postrema of the cow consistent with work in other
species[10] Other studies provided evidence
(usually immunohistochemical) for the presence
of cholecystokinin neurotensin angiotensin II
prolactin and insulin or their binding sites in the
area postrema of a variety of animals (e g rats
other rodents and primates)[16] A number of
neurotransmitters and peptides were administered
to animals with the idea of characterizing the
responsiveness of neurones of the area postrema
and by 1983 Brooks and colleagues had
attempted recordings in an isolated brain tissue
preparation and found neurones unresponsive to
glutamate serotonin angiotensin II dopamine
and osmotic changes[26] However Carpenter[41 45]
carried out extensive work recording from area
postrema neurones in the dog in which 17
common transmitters and peptides were
employed Excitatory responses were found to
glutamate, histamine, noradrenaline, serotonin
dopamine, apomorphine angiotensin II
neurotensin leu enkephalin vasoactive intestinal
protein (VIP) thyrotrophin releasing hormone

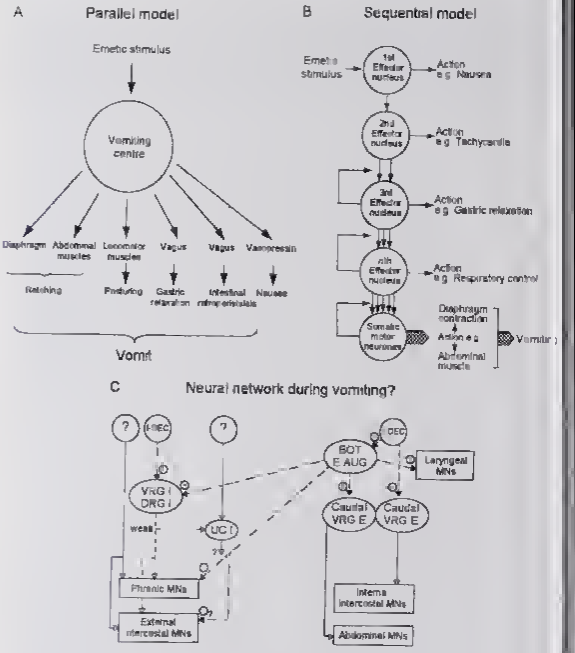


Figure 1 Different types of model of the vomiting centre from the black box conceptual approaches of parallel and sequential models (A and B) of Davis *et al*. Reproduced with permission from Reference 31 to the neural network model of Miller (C). Reproduced with permission from A D Miller. I DEC decrementing inspiratory VRGI ventral respiratory group DRGI dorsal respiratory group UCI upper cervical BOT Bötzinger E AUG augmenting expiratory MN motoneurons

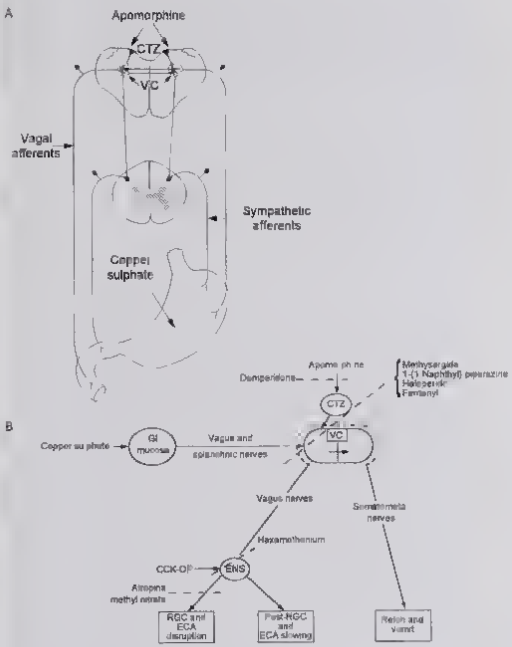
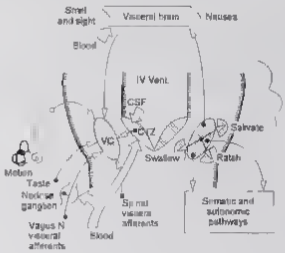
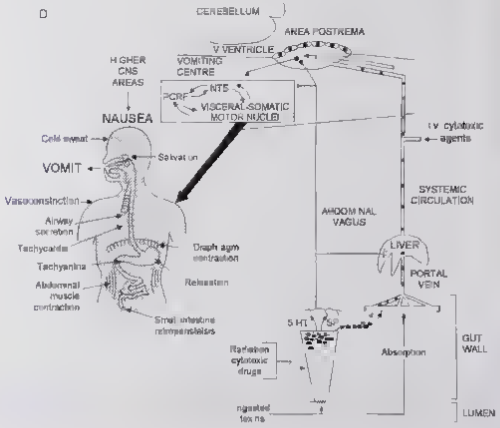


Figure 2 (continued overleaf) Different types of schematic representation of the organization of the emetic reflex from the original Wang and Borison (A) 1952 model[36] to Lang and Marvig (B) in 1989[37], Borison and McCarthy (C) in 1983[38] and Andrews, Rapeport and Sanger (D) in 1988[39]. Note that all the models contain essentially the same key elements. CTZ/area postrema/trigger zone; VC/vomiting centre; CCK-OP/cholecystokinin octapeptide; ENS/enteric nervous system; RGC/retrograde gastric contraction; ECA/electrical control activity; NTS/M/nucleus tractus solitarius; PCRF/parvicellular reticular formation; 5-HT/5-hydroxytryptamine; SP/substance P. Figures 2A and 2D reproduced with permission from References 66 and 67 respectively

C


Smell and sight
Visceral brain
Nausea
Blood
IV Vent.
CSF
VC
CTZ
Salivate
Swallow
Retch
Motion
Taste
Noxious ganglion
Vagus N visceral afferents
Blood
Spinal visceral afferents
Somatic and autonomic pathways

D


CEREBELLUM
AREA POSTREMA
V VENTRICLE
HIGHER CNS AREAS
VOMITING CENTRE
PCRF
NTS
VISCERAL-SOMATIC MOTOR NUCLEI
NAUSEA
i.v. cytotoxic agents
Cold sweat
Salivation
VOMIT
SYSTEMIC CIRCULATION
Vasoconstriction
Airway secretion
ABDOMINAL VAGUS
Tachycardia
Diaphragm contraction
LIVER
Tachykinins
Relaxation
PORTAL VEIN
Abdominal muscle contraction
Small intestine mechanoreceptors
5-HT
GUT WALL
Radiation cytotoxic drugs
Absorption
ingested toxins
LUMEN

RH) gastrin ras spre[illegible] substance P It is not clear how the scientists relate to the emetic chanisms activated by cytotoxic drugs and ainin bat they do support Leslie s ervations of the area postrema and related ictures as a region of striking neurochemical mplexity

nteresingly there is some direct evidence for role of the area postrema and chemoreceptor gar zone in man This work was carried out in 52 in five patients suffering from intreatable miting resulting from inoperable brain mours At craniotomy the topography of the amus scriptions was found to be very similar to t of the dog cat and monkey and in each case area postrema was lesioned with the result that miting was relieved and moreover the patients became refractory to apomorphine when allenged after complete recovery from the gery[45]

An important advance in our understanding of central organization of emetic mechanisms ne from the studies of Costello and Borison in 77 They found that the anti emetic effects of ioids were blocked by naloxone given stemically but that the emetic effects were ly blocked by naloxone given intracerebro ntricularly[44] They suggested the existence of anti emetic centre in the reticular formation ich exerted an endogenous anti emetic force diated by enkephalins The significance of s work may have been underestimated cause if the endogenous inhibitory chanisms were fully understood they could vide a novel pharmacological approach to e emetic therapy (see also studies by Zabara *et* below) Enkephalins were included in a major pothesis put forward by Harris in 1982 ncerning the mechanism of cytotoxic drug nced vomiting which involved the effects of kephalins on specific opioid receptor subtypes hibited between such emetic and anti emetic uctres[45] It was proposed that cytotoxic drugs ght act by inhibiting different phases of the thesis of enzymes involved in the breakdown enkephalins leading to an increase in their ncentration at a critical point in the emetic hway which in turn would lead to an ivation of emesis This hypothesis was one of first to attempt to provide a unified chanism for the way in which a chemically erse range of cytotoxic drugs activates esis The search for a unified mechanism alleges with attention now focused on the eration of free radicals in enterochromaffin ls

Peripheral mechanisms

As early as 1910 Miller found that the afferent nerves in the vagus controlling emesis during the emetic action of mustard seeds and concluded that the vagi alone were responsible for this function as immediately following vagotomy emesis was no longer capable of being elicited which was not the case after section of the splanchnic nerves[46] The importance of afferents in the vagus was further stressed by Bayliss in 1940 who produced vomiting by intraperitoneal injection of staphylococcal enterotoxin and found that emesis rarely occurred following division of the vagi[47] Interestingly irritation or distension of the small intestine was more effective in inducing emesis than similar stimulation of the stomach as Keeton had found in 1925[48] Generally the abdominal vagal afferents were found to be more important than afferents travelling in the splanchnic nerves The importance of the vagal afferents was recognized as early as 1910 by Miller who elicited vomiting readily through electrical stimulation of the cut central ends of the vagal branches supplying the stomach

In 1972 Zabara and colleagues introduced the concept of neuroinhibition in the regulation of emesis[49] Emesis preceded by retching could be induced in the dog by electrical stimulation of the abdominal vagal nerves at the supradiaphragmatic level So Zabara suggested that failure to produce retching or emesis by similar stimulation of the cervical vagal trunk meant that either the abdominal vagal afferents did not travel in the cervical vagus or that inhibitory fibres were present They concluded that inhibitory fibres were present as the retching and vomiting resulting from stimulation of the supradiaphragmatic vagus could be prevented either by transection of the cervical vagus or by simultaneous stimulation of the cervical vagal trunk They maintained that the excitatory system involving the vomiting centre and chemoreceptor trigger zone acts in conjunction with an inhibitory system so that emesis is normally prevented by a dominance of inhibition over excitation

At the centre of the vomiting reflex lies the gastrointestinal tract and although vomiting continues in its absence the gut remains the organ around which the reflex in its present form has developed Drawing on the ideas of the previous authors (e g Hatcher and Weiss [3]) and a review of the concepts and data presented at the 1984 Oxford meeting on emesis[5] Davis Harding Leslie and Andrews proposed the view that the defence of the organism against toxins is organized into a tiered or layered system

(*Table 1*) The hierarchy of defence mechanisms is designed to protect the organism against penetration by toxins of various types. It was proposed that viewing the system in this way would go some way to explaining the disparate responses of different species to similar stimuli and perhaps similar responses of individuals to different stimuli. For instance it is generally accepted that laboratory rats do not vomit they do however develop a profound conditioned taste aversion to wide ranging stimuli including X radiation and toxins which cause vomiting in other species. The omnivorous rat displays a bias probably established by natural selection to associate gustatory and olfactory cues with internal malaise even when these stimuli are separated by long time periods. The first line of defence in the rat (i.e. smell taste) appears to be extremely highly developed and, therefore, perhaps as a result the third and last line has become redundant and is now non functional. In laboratory rats even the second line of defence (located in the gut) seems to be obsolescent because, although it is known that gastric afferents in the rat respond to intragastric copper sulphate vomiting does not result. The detection apparatus is present but the vomiting response absent. Essentially here we have an example where the primary defence mechanism is so highly tuned that the animal no longer needs to rely on the other two lines of defence downstream, so that in this animal the latter are no longer effective. The reality check for us in 1984 when we put together this idea was to look for other physiological systems to which it might apply. In the case of the mammal there are only two systems designed to absorb into the body exogenous substances from the environment. Both systems are fundamental to sustaining life and therefore we would predict require adequate protection. The other comparable organized system is the respiratory system (*Table 2*).

The mucosa of the gastrointestinal tract play a particularly important part because although it represents the second liner of defence, it is the last barrier to toxic molecules before they enter the body of the organism proper[51]. The gut then functions as both the absorptive site for food and a sensing mechanism for recognition of potentially toxic material. Up to 1984 researchers had for some time concentrated their efforts on investigation of the effects of area postrema ablation, as emphasis had appeared to shift from the periphery to the CTZ after the delineation of the chemoreceptor trigger zone within the area postrema and its distinction from the vomiting centre. Few papers had been published[49,51,52] that examined the effect of abdominal vagal section on vomiting, since the series by Borison and his co-workers in the 1950s[53,54]. Concentration on the area postrema and the effect of its destruction on various types of vomiting, however produced vet more controversy because the procedure is a technically difficult one and brings with it no guarantee that the animal will even survive the surgery on the brainstem because of potential damage to neuronal systems controlling respiration for instance.

Animal models of man: a continuing debate

Before I draw this review of the last 300 years to a close there is one more thing to mention: animal models. For the century up to 1980 three animal models dominated research into nausea and vomiting namely, the dog, the cat and the primate. Studies confining themselves to elucidating the structure and function of the area postrema have been carried out largely in the rat as had those on conditioned taste aversion. However, Brizzee and co-workers had already noted in 1955 that the

Table 1 The hierarchical organization of the defence mechanism for protection of the organism against toxins

Level of defence mechanism	Location of toxin	Type of sensor and location	Effect	Result
First	External to gastrointestinal tract	1 Smell and taste 2 Peripheral	[a] Avoidance [b] Nausea	[a] Learned aversion for potential toxins
Second	Intragastric	1 Gastric chemoreceptors 2 Near the absorptive site	[a] Nausea [b] Gastric motility↓ [c] Avoidance [d] Vomiting	[a] Learned aversion [b] Confining toxin to one site [c] Ejection of toxin
Third	Within the vascular system	1 Area postrema (CTZ) 2 Within the CNS	[a] Nausea [b] Gastric motility↓ [c] Vomiting	[a] Ejection of toxin [b] Confining toxin [c] Learned aversion

ble 2 A hierarchical organization of the respiratory defence mechanism

...t of defence	Sensor and location	Protective mechanism
st	Nasopharynx and upper airways receptors	Sneezing and coughing reflexes
cond	Lungs various pulmonary receptors	Hering Breuer and lung irritant reflexes
rd	Carotid aortic and medullary chemoreceptors	Respiratory chemoreceptor reflexes

...moreceptor trigger zone for emesis in the ...nkey is virtually non functional from the ...ndpoint of drug action [57] and the ED_{50} for radio...mesis is twice that in humans at about 450 cGy ...e cat too has a very high threshold to radiation ...duced emesis of the order 2 5000 cGy The dog ...d until the 1980s been the animal model of ...ice for over 170 years and its emetic responses ...closely analogous to humans But all three ...imals were becoming very expensive ...reasingly difficult to obtain and moral and ...ical objections were being raised ever more ...ongly against their use With the renewed ...petus for research in this area fuelled by the ...uirement to solve the cancer therapy side effects ...oblem there was a need for an alternative animal ...odel The ferret *Mustela putorius furo* L was ...e animal that emerged as that new model largely ...cause it is a small inexpensive carnivore that ...mits to apomorphine Two reports in 1981 and ...982 by Florczyk Schurig and Bradner raised the ...ofile of the ferret, with successful experiments on ...gitalin induced vomiting[58,59] and it was they who ...oposed using the ferret for future work in this ...a Coincidentally Andrews and Scratcherd had ...ready published extensively on the physiology of ...e reflex vagal control of the ferret stomach and ...d elicited retching to vagal afferent stimulation ...der urethane anaesthesia[60] At the time I started ...rk in Oxford in 1983 the ferret was the natural ...oice as the experimental animal However its ...sponse to a wide range of emetic agents was ...ortly characterized and required lengthy initial ...udies to determine whether it could provide an ...propriate and reliable model for studying the ...echanisms of cytotoxic drug and X-radiation ...duced vomiting in humans A variety of ...armacological and surgical techniques were ...ed focusing particularly on the role of the ...dominal innervation In addition the 2 ...oxyglucose autoradiography technique was used ...study the brainstem pathways involved in ...mesis[61] This was the first use of such a brain ...aging technique to study emesis in the ferret In ...rallel Sanger and Miner began to use the ferret ...r their explorations of serotonin pharmacology ...demesis followed by Costall Domeney Naylor Gunning and Tattersall the early results of these studies being published in 1986[62,63]

The issue of the most appropriate animal model for emesis in humans is still the subject of discussion not only from an academic viewpoint but also because of the important need for predicting the outcome of clinical efficacy from preclinical studies In the past five years two new models have emerged the pig[64] and an insectivore the house musk shrew *Suncus murinus* In addition, by modification of dosing protocols a model for delayed emesis has been developed in the ferret The predictive value of these newer models is not yet known but whatever the outcome all the studies serve to increase our overall understanding of emesis, which can only advance the design of better anti-emetic treatment

Epilogue or Prologue?

And so we reach the 1984-5 time frame and the Oxford meeting referred to earlier[50] At that point however research had reached an impasse What was needed was a pharmacological tool that would match our physiological techniques for elucidating the pathways involved in control of cytotoxic and radiation induced nausea and vomiting There were few if any clues in 1984 as to what that might be for serotonin was mentioned on precious few occasions Yet within two years Miner and Sanger had published their seminal paper on the prevention of cisplatin-induced emesis in the ferret using a $5\text{-}HT_3$ receptor antagonist[6] and within 10 years the sales of such drugs had reached many millions of pounds sterling worldwide For all of those who had been involved in studying emesis for a number of years the world changed from an emphasis on studies involving the area postrema and its role to exploring our observations that vagotomy paralleled the effect that the $5\text{-}HT_3$ receptor antagonists had on emesis[65] Wang and Bonson's 1952 wiring diagram [5] evolved into something altogether more satisfying (Figure 2D)[62]

For the patient the most important element in all this endeavour this breakthrough for it can justifiably be called that has meant a significant increase in the quality of life and I am sure in some

cases it is no exaggeration to say the chance of life itself

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History

Singular Experiences - The Early History of Anaesthesia in the Royal Navy 1847 to 1854

P A Glew

Introduction

One of the major advances of 19th century medicine was the advent of painless surgery following the introduction at the end of 1846 of ether and a year later of chloroform. It is hardly surprising that the use of anaesthesia spread rapidly throughout the world a situation that was not mirrored in the Royal Navy. It was not until 1852 that chloroform became generally available and until then Naval anaesthesia was practised by only a few enterprising men who both had to learn the techniques themselves and obtain their own supplies. The object of this paper is to chronicle the experiences of these pioneers.

Thomas Spencer Wells

Although better known as the pioneer of oophorectomy Wells's earlier career was as a medical officer in the Royal Navy. Almost all of his active Naval time was spent in the Mediterranean initially at Malta (both on board the receiving ship HMS *Ceylon*[3] and then at the Naval Hospital Bighi[4]) and later on board the Mediterranean Flag Ship HMS *Hibernia*.[5]

On 6 March 1847 only some three months after the demonstration of ether in London Wells gave his first successful anaesthetic using a Hooper inhaler in the Naval Hospital.[6] *An officer about to undergo an operation having expressed a wish to experience its effects in as subject to the action of Ether Mr Wells administered the vapour and Dr Watt performed an operation requiring two large and deep incisions without the patient suffering the least pain. After inhaling for nearly two minutes he became quite insensible the incisions were then made and he did not make the slightest motion. After about two minutes he came to and he said that he had felt himself as if flying over the heads of the bystanders.*[7]

Surgeon Commander Glew is retired from the Royal Navy and is currently working at Bristol Royal Infirmary.

This may not be the first anaesthetic that Wells gave although it was certainly the first successful one as there is some evidence to suggest that Wells and Dr Barmester a civilian surgeon then resident in Malta, performed some experiments with ether in the preceding month. The apparatus was of their own design but because of the excessive dilution of the ether vapour with air they were unable to achieve adequate anaesthesia for the partial amputation of a hand. As a result this Wells sent to London for a Hooper's inhaler which he received two days before his first successful demonstration of anaesthesia.[7]

On 16 March after using ether successfully three further times Wells presented his initial experiences to the local medical society (Society of Medical Encouragement) demonstrating the Hooper inhaler by anaesthetising Albert with only limited success two members of the society.[17]

Over the succeeding few months he gave ether to 106 anaesthetics for a range of operations mostly dental extractions but also 15 amputations 1 thotomy excision of tumours and drainage of sinuses. In 73 cases he used the Hooper inhaler but regarded only 15 of these a complete success in the remaining 33 cases he used ether soaked sponge with considerably more success. His experiences led him to recommend that *the* [ether soaked] *sponge must be preferred to the apparatus by the practical surgeon.*[8]

Of his original cases one deserves a special mention because he used ether to try to control the convulsions of a Maltese woman with hydrophobia. Unfortunately the attempt had to be abandoned almost immediately because the woman could not tolerate the ether.[9]

June 1848 brought the Paris insurrection and Wells having recently left HMS *Hibernia*[10] was there to study the treatment of the casualties. In a subsequent report to Sir William Burnett, the Director General of the Medical Department of the

ıyy briefly discusses the use of chloroform
mmenting that there had been several deaths
ributed to it, Wells himself witnessing one of
m[1] This one experience coloured his opinion
inst chloroform for the rest of his life He said *I
s from the first afraid of it* [chloroform] [1] and
most of his career he insisted that his patients
re anaesthetised with methylene bichloride.
His unease did not stop him from using
loroform, though never for surgical procedures
though not the first to try[13–15] he did
ccessfully use chloroform in the treatment of
ute asthma and also as a palliative of the
mptoms of severe respiratory disease.[16]

ampbell, Duigan and HMS *Columbine*

hough Wells can rightly claim to be the first
ival anaesthetist he only ever used ether for
rgical procedures The first Naval use of
loroform which was introduced into clinical
actice at the end of 1847 and rapidly replaced
ter allegedly took place on board the sloop
MS *Columbine* Unfortunately all we have to go
is a brief account published one hundred years
er[17]

The Commanding Officer of the sloop
mmander C D Hay (later Admiral Sir
dryrnple Hay) obtained both chloroform and
technique for its use from Simpson and then
velled overland to join his ship before it sailed
he East Indies Once the *Columbine's* medical
icers Dr Campbell and Dr Duigan had studied
technique for its use n volunteer was found
m amongst the officers the captain's clerk Mr
nfold who was suffering from toothache
nfold was anaesthetised with chloroform in
ont of a Petty Officer from each Mess and five
rten teeth were removed painlessly The exact
te of this is unknown but was reported as 1847.[17]
A closer examination of this account to try to
ore accurately date it unfortunately leads to
veral inconsistencies Commander Hay's
pointment date was 6 December 1847[18] which
eans that it could only have taken place after the
The other main characters Dr Campbell was the
ip's medical officer and had been for some
me.[19] It is at this point that some discrepancies in
s account begin to appear Dr Duigan was an
sistant Surgeon in the Navy during the
propriate period but was appointed to HMS
hermia[20] the same ship and at the same time as
ells[15] Being an immediate contemporary of
ells Duigan would have had ample opportunity
have gained some insight into anaesthesia from
m Now to place Campbell and Duigan together
is necessary to have *Columbine* in the West
sailing for the East Indies meet with *Hibernia* A
clear opportunity for it to have occurred existed in
Gibraltar and although it is purely conjecture it
would allow Commander Hay (travelling
overland) to join his ship

The one real difficulty of this whole story has
been locating the patient Benfold Examining the
Navy lists for this period there is only one Benfold
in them a purser who remained without an
appointment.[16] This failure implies that Benfold
did not hold a commission directly contradicting
the 1847 account and although this does not
negate it (Benfold for instance could have been a
civilian) it does mean that we must place less
reliance upon it Without any further evidence it is
only possible to suggest that this event probably
took place in the closing few weeks of December
1847

Charles Deane Steele

It was with the introduction of a new Scale of
stores into the Navy on 1 April 1852 which
contained many medicines that were in common
use in private medical practice in England that
chloroform finally became generally available to
the Navy Although a copy of this document could
not be found, we can safely conclude that it did
contain chloroform because at the start of the
Crimean War Barnett issued circular h88 to all
Naval hospitals instructing them to double the
quantity of chloroform supplied to all the ships
bound for the Crimea [1 2] In the intervening two
years no new Scale was issued

With chloroform now available to the Navy its
use on board a ship at sea soon followed On 12
August 1852 Charles Deane Steele Surgeon of
HMS *Arethusa* removed a piece of loose cartilage
from the elbow of a seaman He performed a
similar operation the following year and only then
published an account of his experiences not
because of his use of chloroform but because of the
comparative rarity of the delayed complication
following injury to the elbow.

The first decade of anaesthesia was a period of
uncertainty concerning its role in treating injured
parents and the early enthusiasm for its use was
replaced by considerable scepticism. This is
probably best illustrated by Dr Andrew Smith the
Director General of the Army Medical Corps in
*the case where a man having received a gun shot
wound which rendered immediate amputation
necessary the depressing effects of Chloroform
would render the recovery of the man less
probable than that of a man who underwent the
operation without chloroform* [6] Steele amply
demonstrated this maxim when he amputated the

left leg at the [illegible] thigh by the discharge of a gun. The operation took less than a minute and he did not use chloroform despite his prior experiences.[4] It was only because of the evidence from the Crimean War that this point of view was changed.[6]

The Naval Hospitals

Despite the early use of anaesthesia in the Naval Hospital Malta it is rather disappointing that the introduction of anaesthesia in the mainland Naval Hospitals caused so little comment that no contemporary records are available. It has been reported that the first use of chloroform in Haslar occurred some time after its inclusion on the new Scale of 1852. All we know is that at the instigation of Sir John Richardson who is perhaps better remembered as a botanist and polar explorer[7,8] a patient had a circumferential amputation of a limb.[26] There is no record of the early use of chloroform in any of the other Naval Hospitals.

To try to explain this silence we must examine the need for anaesthesia. In the earliest available compilation of hospital records for the year 1869 we find that the majority of patients that were admitted to Naval Hospitals had medical problems most commonly infectious diseases while relatively few had surgical problems. This is supported by the statistic that for 1869 there were only 15 operations carried out in Haslar and these were all of a trivial nature.[7] There is no reason to believe that for the period we are looking at the situation was any different. This because surgery played only a very minor role in the hospital life it is perhaps hardly surprising that anaesthesia has been almost completely ignored.

This minimal requirement for anaesthesia in the Naval Hospitals did not mean though that the medical officers there were ignorant of the use of chloroform. Alexander M Kechnie a Naval Surgeon in Haslar successfully gave chloroform to a patient under the care of Dr Lowes of Gosport with tetanus in 1853.[5] A year later in Stonehouse an Army surgeon suggested using chloroform to allow a patient to tolerate the prolonged application of compression pads to treat a popliteal aneurysm. The suggestion was not taken up.[28]

Conclusion

Prior to the Crimean War we can see that anaesthesia had only a very minor role to play in the Navy despite its successful use by a few individuals both before and after its inclusion on the Scale of Stores of 1852 reflecting the prevailing attitude to its use in injured patients.

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etters to the Editor

rgeon Commander Neil Cripps forthright hating point in Volume 82.3 of this journal uld have provoked all Consultants with a ponsibility for training into a severe reappraisal their aims and objectives in providing first class nsultants for the future.

Calman is with us and there is no longer any ntin mourning the past. It behoves us however tain positions of trust and responsibility where can shape the Calman skeleton into an proved entity that not only allows us to be uated on the national and international surgical ge but reflects the additional specialist demands r military service demands of us. The Canadian tem is good but not foolproof and as ever there middle way that will allow us to cherry pick the t, for it is the best that we must achieve.

Within the much depleted consultant base exist talent, drive, youth and vigour to achieve this *llowed and encouraged to do so*

This highlighted phrase is the crux of the blem. Dynamic selling of our talents to the al community can only occur if those that do e the drive and impetus are given stability of ical practice on which to base their efforts se that do not have the required motivation l to reconsider their position on the cational stage. Good training can only come n a sound and respected clinical base. unnity throughput, the respect of local GPs la desire to seek out the work are the tenets ou ich training is based. Educational ifications and techniques for training the ners are all quality goals which will be negated ere is no correction of the underlying malaise. As a direct result of this view very urgent sideration has to be given to the deployment of career and reducing resource. It should be reciated that there are high quality juniors in Royal N val Medical Service who wish to n in surgery and then remain to serve as sultants in operational support of their chosen vice the Royal Navy and Royal Marines se consultants of the future, and their current iors are unlikely to be similarly attracted to tain in the Service if as at present they see their ire as a series of frequent deployments in ilitionally Army environments due largely to a sistent severe under bearing of surgical staff in Army Medical Service.

Moreover there is [illegible] review the rationale of deploying surgical teams within the maritime environment. For example it may be acceptable for the surgical team to join a CVS only when the Air Group is deployed out of home waters rather than being on board at all times allowing the day to day medical care and charge of the Medical Department to be provided by medical practitioners who are more appropriately trained in these skills and the surgical team to apply its specialised skills where there is an abundance of appropriate patients and thus maintain training and avoid skill fade.

So where do we go from here? To move forward to allow the rebuilding of a shattered system requires vision and determination. It requires a commitment to Consultant Practice in as stable an environment as we can achieve. It requires the Consultants to appreciate there is a future and to plan for it and for the juniors to see that the grass on the other side of the fence is just a different shade of brown. Trainees will be attracted by quality of practice, structure and the perception that the Director of Studies or Professor has a plan and vision for the future. It also requires a new perception that resources are scarce and getting scarcer. A high proportion of the young blood wants to stay and make it work but their loyalty to the RNMS has been sorely tested and the words of the RCDSC it is not clear whether it will recover is a frightening potential epitaph.

Yours faithfully

D N TULLOCH FRCSEd
Surgeon Commander RN
Head of Urology

Dear Sir

Eighteen Field Gunners and a Dictum – A recipe for success?[9]

The annual Royal Tournament takes place at Earl's Court with one of its highlights being the Interport Field Gun Competition. Field gun has its origins in the battle of Ladysmith 1899 when in order to achieve success, it was necessary to transport one ton of gun carriage and limber across country to the fighting fronts. Obviously the need for such military manoeuvres no longer exists but field gun has survived as a spectator

sport. Ladysmith has been replaced by an obstacle course where the gun is dismantled for transport on and over the ground reassembled and fired on ontward and home runs all in around two minutes and fifty seconds. Three crews of 18 men compete in the event and all are volunteers. Selection is based not only on the physical qualities of strength stamina and speed but also on mental endurance and commitment to the crew.

A major problem experienced by crew members during the 10-week training season is weight loss. It is correctly implied that loss of body weight in fit, highly trained men implies a loss of muscle mass and therefore power and body strength. Four years ago I was asked by the Portsmouth crew to assess their dietary intake and advise on possible improvements. As a consequence changes to diet and eating patterns have been introduced with good effect.

Before any significant dietary changes could be made it was necessary to be accepted by the crew. It was only possible to gain credibility by having a working knowledge of the actual practice of running field gun and also being aware of the tremendous tradition and peer pressure which envelops it. For this reason my first year with the crew was very much a learning experience for us all. The men showed little awareness or interest in nutritional matters gained what knowledge they had from body building magazines and held very fixed ideas about food. The eating routine during the training season consisted of breakfast and the evening meal being eaten in the dining hall with a cold lunch being taken at the track. The time available for eating was wholly influenced by the training schedule which was erratic weather dependent and subject to daily change. As a result of this lunch and the evening meal were often severely delayed or missed altogether.

As the estimated required daily energy intake was in excess of 5000 kcal it was not possible to follow the recommendations of the UK's Committee on Medical Aspects of Food Policy 1991. Providing only 30% of the total daily energy intake as fat would have made it difficult to meet the energy requirement and also made the food unpalatable and therefore unacceptable to the crew.

In 1993 my second year pre season work included introducing evening meal menus which upturned carbohydrate and energy intake while not obviously changing the type of food the men were used to eating and accepted. A formal talk to the crew advised them on appropriate eating habits and subsequently advice was given on an individual basis.

The crew members were weighed weekly it was neither practical nor considered necessary undertake more detailed anthropometry. Over the 10 week season weight changes of individuals ranged from a gain of 1 5kg to a loss of 7 5kg with an average weight loss of 2 9 kg.

In 1994 dietary intervention commenced much earlier. Advice sheets were sent to potential crew members three months before the start of the training season. These encouraged the individual to examine their own eating habits and ensured that they were aware of the influence of nutrition on sport performance. The men were also actively encouraged to gain weight prior to the season and thus minimise weight loss once training began in earnest. To this end the men were weighed at the twice weekly pre season weight and circuit sessions and informal talks on diet were given. It also became apparent that the attitude and influence of the trainer were crucial to the success of any dietary intervention. Therefore his willingness to reorganise the training schedule to include a half one hour lunch break and the guaranteed completion of training by 1700 each day to ensure the evening meal could be taken was extremely helpful.

Lunch time food consumption was promoted by introducing a more varied menu of attractive food. Pasta and rice dishes replaced baguettes and providing adequate refrigeration crockery tables and chairs enhanced the sociability of the eating environment. The menus for the evening meal remained unchanged but catering staff were encouraged to make any extra food available. Field gun crew members. Weight changes in the season ranged from a gain of 1 kg to a loss of 5 kg with an average weight loss of 1 7 kg.

These changes were maintained in 1995 and the lunch menu was amended further to increase acceptability and consumption. Some of the crew members had taken part in training in 1993 and the positive influence on diet was helpful to the new crew members. Weight changes ranged from an increase of 2 kg to a loss of 4 5 kg with an average weight loss of only 0.5 kg an 83% reduction in weight loss compared with that in 1994.

Key factors in this recipe for reducing weight loss during the arduous 10 week training season included high quality ingredients care in preparation an open minded chef and a taste for something different all combining to produce a highly successful product.

Yours sincerely

Helen Dyer BSc (Hons) SRD AKC
Senior Dietitian
RH Haslar

ur Sir

r East Exhibition

doubt many of your readers were like myself ving with the forces during the Burma npaign 1942 1945 and would therefore be rested in a permanent exhibition to be set up at xford Airfield during the latter part of this year ollowing an article in Summer 1995 issue of *Star* and other Services Journals and wsletters donations towards this exhibition e come in slowly some from overseas These ever were not adequate to enable any real gress to be made in establishing the Permanent r East War Exhibition at Duxford Airfield in form we (the Burma Star Association Herts nbs and Essex Borders Branch together with Imperial War Museum Duxford) visualised t was therefore decided to make an application a grant from the National Heritage Fund This at has been approved and the project has been arded £120 000 towards a total estimated cost of 0 000 with IWM Duxford and ourselves viding the balance, shared equally between our organisations Ten thousand pounds have ady been contributed and I am now seeking to e a further £25 000 to complete the project

[redacted] already been commenced and which we hope will be up and running before the end of 1997

A National Appeal for funds is now being made and any donations whether large or small either from Branches of the Association or from individuals are welcomed These should be made payable to Far East Exhibition Appeal Fund (**NOT** to the Burma Star Association as this is not a Benevolent Fund appeal) and sent to the undersigned at Little Foxes Hay Green Therfield Herts SG8 9QJ

Also if you have any artefacts or memorabilia you feel would be of special interest and which you would be prepared to donate please send details only in the first instance to the same address Any further information can be obtained by telephoning 01763 287519

Please support this exhibition

Yours sincerely

Eddie Cooper
Project Secretary
Burma Star Association
Herts Cambs and Essex Borders Branch
Far East Exhibition Appeal Fund

Book Reviews

Divers| From Piper Alpha to the Gnlf War Joa May Hodder and Stoaghton (Coronet Books) 1996 Pp 245 £6 99

Joa May the aulhor of this book began his workiag career in teaching and it was quite by chance following a meeting with 'I aew acquaintance at a New Year s Eve party that he decided to try the sometimes harsh and difficult lifestyle of 'i Diving Paramedic It is perhaps rather fortunate that this change occurred later oa in life as some of the predicameats he fonad himself in and was asked to sort solve or treat benefited from a more mature, attitude towards life The book is mainly about his years spent travelling aronnd the world aad working oa different diving vessels or sites It is light reading and chronicles his travels from the shores of Scotland to far flung exotic destinaaons sach as Cambodia, while meeting an ahnadaaee of interesting characters human as well as animal along the way Examples of this are the Groaning Goat of Nhava in Bombay or the sea snakes of the Arabian Gulf which unfortunately tested their oral streagth on an arm and leg of two different people oa the same bnsy day

Some of the decisions that Jon May had to make were in an emergency sitn-tioa and would have put an A and E Coasaltant to the test A highlight of the book is the harrowing talk of the Piper Alpha disaster He gives a detailed account of that night and how one moment he was sitting quietly when the next they heard There s a fire oa the Alpha platform Jon May that night experieaced every medically trained person s nightmare All at once all the trataag seemed a very thin defence in the f ice of such overwhelming disaster

The book is interesting and gives the reader a real feel for what a person might be letting themselves in for if they decide to try a career in the wide and varied world of the Diving Paramedic

D S Parker
POMA (Diving)
Institute of Naval Medicine

French's Index of Differential Diagnosis. Thirteenth Edition Eds I n A Bouchier Harold Ellis Peter R Flemtng Batterworth Heinemann 1996 Pp 812 £40 00

The first (1912) edition of this now classic British medical text was written by Herbert French while serving as an assistant physician in Guy's Hospital the book s symptom orientated approa was different from most medical textbooks an was an immediate sneeess The Thirteenth Editi has been thoroughly revised and npdated h follows the same tried and tested form symptoms and signs are arranged in alphabeti order and this allows the clinician to refer to section on for example Gait Abnormalities for diagnostic hints and aree for raspiration!) The t of the causing paragraphs gives a concise acco of the main features of the various diagno possibilities often supplemented by lists of small print Most relevant clinical signs illustrated throughout the book, by a pleas mixture of classical (usually gross) monochro examples and excellent modern colour pho graphs dermatological conditions and enhanc manifestations of disease both surgical medical are particularly well illustrated Th are also numerous radiographs and use anatomical diagrams

French's Index is essentially a diagnostic and does not cover treatment, but this curious friendly textbook will be a valued addition to m personal libraries and is sure to become a w thumbed tome on any sickbay or chart bookshe

J K Broo
Senior Medical Officer Hyperbaric Medic
Institute of Naval Medic

What should I do? Do I go to the doctor? Edition E van der Does RG Metz RT Publishing Ltd Southampton September 19 Pp 64 £3 50

This booklet has been written by two Dutch gen practitioners and adapted for UK consumption t two British general practitioners It has b designed to provide patients with simple advice a variety of common conditions in order that th may make an inform ed decision on its furt management This the authors suggest, will al the patient to make a choice between self care visiting the doctor Guidance is also given on h quickly patients should contact their doc whether it be immediately or within the next days A variety of subjects are covered rang from acne to wound management The conditi are described in free text followed by advic bullet point format interspersed with numer illustrations The Forty two sections are all v written easy to follow and contain simple sens

vice There are some omissions however such sections on abdominal pain chest pain and ane depression The absence of the latter somewhat prising since the importance of its early ognition was stressed in the recent Defeat pression campaign of the RCGP
There is little to find fault with in the booklet and ctitioners would find it very useful to give to ients in addition to their Practice leaflet

rgeon Lieutenant Commander PA Hughes
Senior Medical Officer
HQ AFSOUTH

ide to Postgraduate Medical Education BD ughlev S Murray BMJ Publishing Group tober 1996 Pp 157 UK £17 95 Overseas 0 00

th the growing pace of change medical owledge gained as an undergraduate will ffer for little more than two years Post iduate education therefore is absolutely vital professional development of doctors and to ure the safety of patients The authors describe current organisation of Post Graduate cation as a maze with the book designed as a p to guide the doctor This I feel it fails to ieve The book is difficult to read making it too vidly for the average general practitioner king information What it does provide wever is a wealth of information on education General Practice past present and future luded are chapters on vocational training rmative and formative assessment the mbership examination revalidation audit Academic general practice The book is up to te and provides full details of the recent posed changes to general practice education d training and the influence of European slation

Ill Health Retirement A comprehensive guide to general practice edited and should be considered for inclusion in the recommended list of books for Service GP Trainers and would be of interest to GP academics

Surgeon Lieutenant Commander PA Hughes
Senior Medical Officer
HQ AFSOUTH

Intimate Death how the dying teach us to live M de Hennezel (trans C Brown Janeway) London Little Brown and Company March 1997 Pp 182 £12 99

Originally published in French in 1995 as *La Mort intime* this compact book describes the approach to counselling the terminally ill taken by a clinical psychologist working in a palliative care unit in Paris It chronicles several years experiences of helping patients with terminal illnesses such as AIDS and cancer how to come in terms with and prepare for their own death

The book is loosely structured into illustrative vignettes describing M de Hennezel s approach to counselling the terminally ill Countering the normally clinical client analyst relationship based on professional distance she engages in an emotional bond with her patients unafraid to embrace those in distress to both comfort and understand their suffering She does not advocate retreating behind one s professional white coat but in using one s common humanity to assist those in their final days to come to terms with death

In society shrouded by taboos of death even in the medical profession where it is regarded as a negative patient outcome rather than an inevitable part of life this book presents a refreshing insight both into palliative care and the ultimate human experience death

Georgina M A Slayen
Occupational Psychologist
Institute of Naval Medicine

Obituaries

Surgeon Rear Admiral (D) Philip Stanley Turner CB

Surgeon Rear Admiral (D) W I N Hornsat CB writes

Surgeon Rear Admiral Philip Stanley Turner died on 13 January 1997 in his 92nd year. He was born in Uxbridge, Wells, the son of Frank Turner a business man in that town. He was educated at Cowbridge and received his dental training at Guy's Hospital qualifying in 1927 and was soon after accepted into the Royal Navy in the rank of Surgeon Lieutenant (D).

The Dental Branch had been formed just seven years previously to provide dental treatment to Naval personnel on a regular and routine basis rather than as required only to treatment on request. It was a huge and no simple task. It was a new concept and at first often received with reluctance and at times with refusal. The early dental officers of which Philip Turner was one gradually overcame this reluctance with their skill tact and encouragement. Treatment as a form of preventive dentistry became accepted and appreciated with great benefit to the health of the Royal Navy. Philip Turner played a significant part in this success.

Before the war he served mainly in training establishments and in the battleship HMS Ramillies. During the war he was in the Royal Naval Barracks Devonport the Royal Naval Hospital Plymouth HM Hospital Ship Tjitjalengia and at HMS Buganda the Royal Naval Base Bombay. At the end of the war he was appointed to the Royal Naval Hospital Haslar at first as a Specialist in Dental Surgery and later as a Senior Specialist.

In 1949 by now promoted Surgeon Commander (D) he served in the carrier HMS Implacable and afterwards at HMS St Angelo Malta on the staff of C in C Med being promoted Surgeon Captain (D) in 1955. On return to the UK he again went to the Royal Naval Hospital Haslar and was promoted Surgeon Rear Admiral (D) in 1961 becoming Director of Naval Dental Services. He was appointed QHDS in 1960 awarded the CB in 1963 and retired in 1964.

He had married Marguerite Donnelly a QARNNS sister in 1934 and on his retirement they went to live in Cross in Hand East Sussex. They had one son and one daughter. Their son died tragically in the Hither Green train disaster in 1967. His wife died in 1990 after a long and sad illness throughout which he nursed her. After her death Philip developed Alzheimer's Disease and was cared for for some years, by his daughter Sarah. Finally he moved into a nursing home where he died following a stroke.

All who knew him well will remember Philip as a talented and skilful professional colleague. He was a cheerful and respected friendly man with a great sense of fun and humanity always immaculately turned out. We extend to his daughter Sarah and her family deepest sympathy at their loss.

Surgeon Commander Anthony Norman Bennett RCP died on 14 September 1996 after a long illness which he confronted with the same courage as had characterised his life. He was 66. Although he had retired from the Royal Navy in 1979 his contribution to it had been remarkable for he was a Naval Officer of the kind who in each generation explodes the recurrent myth that there are no longer characters in the service.

Tony Bennett was born and brought up in Bristol and was always proud of being a Bristol boy. His success started in school there enabling him to fulfil his first ambition by becoming a Navy Cadet in 1952 and embarking immediately on the rigorous training. The bare facts of this his first naval career are conventional enough. He saw service in Fireflies Gannets and Skyhawks in various squadrons and from most naval stations as well as from the carriers *Ark Royal* and *Albion* but the manner of his service already marked him out as an officer of signal talents and prodigious enthusiasms. Extrovert and uninhibited he was always at the forefront of squadron activities and wardroom events and was his philosophy then and forever thereafter that what was worth doing must be done with style.

What might have followed had he not then been injured in a flying accident is hard to say but after a spell as an Air Traffic Control Officer it became clear that his health would not allow him to continue as a flyer and he left the Service in 1961. That it had never been in his nature to be the victim of events or to respond to them passively or even

nventionally was even plitted by his [illegible] ction encouraged by his professional and ental contacts with naval doctors that his destiny s a career in medicine. Subsequent events indicated his judgment to the full but required his uncompromising determination and drive ivercome the academic and practical hurdles he d chosen.

Of course he succeeded but often in daunting cumstances the need to survive meant that for ich of the time he worked by day in the wards of aring Cross Hospital and by night in the olesale Wine trade, an industry which retained wholehearted support for the rest of his life lu course he qualified and became a house rgeon in 1966 whereupon his insistence on le again came to the fore. He found that the spital's resident doctors' mess was structurally d socially derelict so he not only recruited a m image of a naval wardroom but also persuaded ding brewers to compete for the honour of pplying it, the winning company being required fund the reconstruction and host the re-opening rty. It will surprise none who knew Tony that the ss became one of the leading social centres of e London medical scene.

It was then time to resume his interrupted naval reer. Having picked up a Diploma in Child alth almost in passing he rejoined the Service a Surgeon Lieutenant Commander in 1968. ediatrics was his objective but first he spent ne 18 months at Jufair as SMO to Commander val Forces Gulf and as MOIC Joint Services dical Centre there. Having returned to the UK d having passed his MRCP at the first attempt in 71, he undertook two years as Medical egistrar at RNH Malta on either side of the itish withdrawal in 1972.

As a result of his professional and social ievements in Malta he became renowned long both service and civilian communities re, but it was on his return and over the next five ars at RNH Haslar that he made his most portant contribution to the RNMS by setting up first full time dedicated paediatric unit and coming its first uniformed consultant ediatrician. Being a trailblazer is often an comfortable task it means demanding space sources and recognition overcoming mediocrity and mutinous resentment while luring others with ur own enthusiasm. The cause could not have nded a better champion. Tony's drive and reserved commitment were combined with a ounce talent for and dedication in the specialty nd he was quite fearless. His pioneering work on ild abuse made him many enemies among those who still prefer to [illegible] ... to the Service but he was [illegible] ... publicise his convictions and ... right. His aim quickly acquired a highly respected professional repu[illegible]

Then when in civil practice was [illegible] ... direction which conflicted with his views he retired prematurely in 1979 and embarked on his final career by putting up his plate in Wimpole Street. It was another high risk operation but again it was typically brave and uncompromising and again his determination brought success. Utterly he was made a Fellow of his College a recognition which gave him much gratification although no more than that of the constantly expressed gratitude and affection of his patients and their parents.

Such an unusual sequence of careers belokens an unusual man. It was sometimes said that he did everything to excess. The truth was that he did nothing without total commitment, and in his presence life was never dull. His enthusiasms – unbridled unconditional – were infectious. They made him a great teacher fluent and memorable and together with his generosity of spirit a great friend whose company was warm lively entertaining and sometimes unnerving. He was a serious achiever but he had an irresistible sense of the ridiculous and he was a hilarious raconteur who left every story better than he found it and in whom from his own accounts nothing ordinary ever happened.

Above all he was a man who knew that life was about people and not about things and despite all his accomplishments he would probably have agreed with Bolloc's lines ... there's nothing worth the wear of winning, but laughter and the love of friends. He had both in abundance. He is survived by his wife their son and [illegible] daughter of his previous marriage.

TRWH

Miss Barbara Nockolds CBE RRC

Barbara Nockolds died on 4 January 1997 aged 87 years. She trained at Guy's Hospital London and joined QARNNS as a Nursing Sister in February 1934. She served with distinction for 25 years until retired as Matron in Chief July 1959.

Prior to World War II she worked in RN Hospitals Haslar Chatham and at HMS *Caledonia*. When war with Germany was declared she was acting senior sister at RN Hospital Bighi Malta remaining there until 1941 a very crucial and traumatic period in the island's history. For the remaining war years she served in RN Hospitals at

home and was for one year acting Matron HM Hospital Ship *Vita* the final months were spent at RN Auxiliary Hospital Bombay followed by a brief period aboard HM Hospital Ship *Amarapoora*. On returning home her duties took her once again to RN Hospitals Haslar and Chatham with promotion to Superintending Sister in 1947.

It was in September 1949 that Barbara Nockolds received her appointment to HM Hospital Ship *Maine* for Matron's duties. The reason for the commissioning of the *Maine* in Malta in 1949 was due to the Chinese civil war which found HMS *Amethyst* trapped in the Yangtze River and gave rise to concern regarding the possible consequences to Hong Kong. The *Maine* with its peacetime complement accompanied the Far Eastern Fleet spending time in the Philippines, Hong Kong and Japan. While based in Kobe the north Koreans invaded southern Korea and the Fleet was placed at the disposal of the US Naval Command. HMHS *Maine* sailed to Sasebo to be ready to receive casualties. For several weeks *Maine* was the only hospital ship on the scene of operations making frequent trips between Pusan and Japan evacuating a total of 1 849 casualties in the first month mostly American servicemen. The arrival of other hospital ships did give some relief to the peacetime complement working in a front line area under difficult conditions below deck and in the typhoon season which presented further hazards and complications.

Barbara Nockolds took charge of the Officers' ward a small below waterline ward accommodating Battle Fatigue patients and also relieved in the operating theatre. In addition the responsibility of the welfare of nursing staff and liaison with the American Red Cross added hours to her daily routine. Ralph Izzard, who was a special war correspondent for the Daily Mail wrote of her: 'A rare inspiring imperturbable and supremely capable woman who never seemed to tire and anyone who had anything to do with her thought the same'.

Barbara Nockolds was awarded the Royal Red Cross in 1951 she returned home in 1952 to RNH Haslar and on promotion to Principal Matron in 1953 moved to RNH Chatham. In 1956 she was appointed Matron-in-Chief and held that position for three years returning in 1959 having been honoured with the CBE in 1958.

On her retirement she cared for her mother in Dorset enjoying village activities and tending their large and lovely garden. Upon the death of her mother Barbara retired to a superb retirement home run by the nuns of the Carmelite order of St Paul the Worker in Dawlish. Here she found complete happiness participating in varied tasks helping the nuns residents and assisting in the canteen run for disabled teenagers attached to the RC Church. She had a strong Christian faith and when age restricted her activities she read a great deal. She was loved and respected by all and in the later years of her life there was wonderfully cared for with great kindness.

All who served with her will remember her for her kindness understanding professionalism leadership and sense of fun. A rare inspiring and much loved lady whose regal bearing was underpinned by an inner serenity which radiated from her. Her final request that her grave stone should be engraved just with her name speaks of her true modesty.

Warrant Officer Lieutenant Albert L Walker BEM died at the end of November 1996 at the age of 7[illegible]. He joined the Royal Navy in 1928 and from that moment he entered the main gates at RN[illegible] Devonport loved every moment of his service. He was fortunate in that he served in the old Royal Naval Hospital at Wanchai. Later the Ruttonjee Sanitorium and after the war again in the new Naval Hospital, Hong Kong now on the Peak.

During the War he served in a minelayer and on a Tribal Class destroyer which took him on Russian Convoys to Murmansk where he spent some time ashore. At the end of the War he was serving in Trincomalee.

After his commission he served as Secretary at various MOICs at Eglington Hong Kong and Plymouth. Always a popular rating he earned his popularity into officer rank. A keen sportsman he was involved with rugby soccer and was an enthusiastic cricketer.

R W Tipp
Surgeon Captain (Re[illegible])

We have also learnt of the death of **Surgeon Lieutenant Commander Francis Thom[illegible] Dulenian RNR** on 9 November 1996 and **Surgeon Commander Thomas Frank Mil[illegible]** on 19 January 1997. **Surgeon Commander Kenneth John Martin Royal Navy** on [illegible] December 1996.

Our sympathy is extended to the relatives and friends of all the above any personal reminiscences will also be welcomed by the Editor.

ervice News

geon Commander N P J Cripps has been rded the degree of Master of Surgery by the versity of Manchester

geon Lieutenant P H Loydale has been vessful in the Intercollegiate Specialty mination in Orthopaedic Surgery

geon Commander R H Taylor has been ointed Naval Associate Dean of Defence dicine

geon Lieutenant Commander R M Preece been awarded the Rover Group Prize by the ulty of Occupational Medicine in respect of his llent performance in the AFOM examination

Defence Medical Services - Secondary Care - RNH Gibraltar

The Government of Gibraltar has agreed with the Defence Secondary Care Agency to take over responsibility for the provision of hospital care to all service personnel in Gibraltar and for the families and other entitled personnel currently serving in Gibraltar. This provision will commence with effect from 1 May 1997 for a trial period of nine months and should lead to a more permanent agreement.

Apology The Editor regrets that in Vol 82 3 Surgeon Commander Cripps' rank was given incorrectly as Surgeon Lieutenant Commander.

Calling All Falklands Veterans

Derek 'Smokey' Cole wants all veterans of the Falklands conflict to contact him if they wish to take part in a march past to remember their fellow Officers and colleagues who sadly didn't return.

The march past will follow a Rededication Ceremony being held by Gosport Borough Council at the Falkland Gardens, Gosport, Hampshire on Sunday 15 June to commemorate the 15th anniversary of the end of the Falklands conflict.

A bronze plaque denoting the Rededication of the gardens will be unveiled by a distinguished guest in the Falkland Gardens, so named because from that spot many people watched their loved ones set sail for the Falklands and where families congregated to cheer and wave their flags on their safe return.

The Band of Her Majesty's Royal Marines along with representatives from the Navy, Army, Royal Air Force and Merchant Navy will take an active part in the service and will be joined by Civic guests and representatives from the Falklands Families Association.

All veterans wishing to take part in the march past should contact Smokey Cole on 01329 822285. He would also like to hear from ships' associations who may wish to take part.

To give the weekend a complete Falklands feel, Smokey will be organising a reunion of veterans on the Polo Field at HMS Sultan, Military Road, Gosport on Saturday 14 June with comedian Jim Davison compering the evening of music and entertainment.

For more information please contact:

Yvonne Poole
Mayor's Secretary
Gosport Borough Council
Tel: 01705 545202

or

Andy Day
Head of Committee Services
Gosport Borough Council
Tel: 01705 545214

MEDICAL AND DENTAL OFFICERS

HONOURS AND AWARDS

NEW YEAR HONOURS 1997

Companion of the Order of the Bath
Surgeon Vice Admiral A L Revell QHS

PROMOTIONS

To Surgeon Lieutenant Commander
D P Badham A C Palmer

To Surgeon Lieutenant Commander (D)
J G Davies N R Trimbull M Kelly
N J Davenport C J Everitt S G Lodge

To Surgeon Lieutenant
E M Armstrong

NEW ENTRIES

Surgeon Lieutenant M Mantle
Surgeon Sub Lieutenant A Stannard

TRANSFERS TO FULL CAREER COMMISSION

Surgeon Lieutenant Commander A J Mellor

TRANSFERS TO MEDIUM CAREER COMMISSION

Surgeon Lieutenant Commander (D)
N J Davenport
Surgeon Lieutenants R Miles A N Bowie
B C C Tamayo M A Whittaker
Surgeon Lieutenant (D) I James K N Wallnee

PLACED ON EMERGENCY LIST

Surgeon Lieutenant Commander (D) S G Lodge

RELEASED ON COMPLETION OF SHORT CAREER COMMISSION

Surgeon Lieutenant C E Shaw

RETIREMENTS

Surgeon Captain M R O Connell
Surgeon Commander C N Warlow
Surgeon Commander Susan Hague
Surgeon Commander (D) N Harkness
Surgeon Lieutenant Commander (D) T B Elmer

MEDICAL SERVICES PROMOTIONS

To Lieutenant
W Meecham D W Finn
R J McGonnigall

Provisional Selections for Promotion
to date 1 October 1997

To Commander
J Dalgleish MBE K Baker

To Lieutenant Commander
S R Holder R P Kenney

NEW ENTRIES

Sub Lieutenant A Welch

RETIREMENTS

Lieutenant K J N C Rich

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

APPOINTMENTS AND PROMOTIONS

As Queens Honorary Nursing Sister
to date 20 December 1996
A/Captain P M Hambling ARRC

To Lieutenant Commander
R M Duke

TRANSFERS TO FULL CAREER COMMISSION

Lieutenant Commanders M Bowen
B C Smith

TRANSFERS TO MEDIUM CAREER COMMISSION

Lieutenant S J Spencer C A Stinton

TRANSFERS TO 8 YEAR SHORT CARE COMMISSION

Lieutenants P M Hainsworth L Ponting

RELEASED ON COMPLETION OF SHORT CAREER COMMISSION

Lieutenant C A Galvin

RETIREMENTS

Captain C M Taylor RRC QHNS

ROYAL NAVAL RESERVE

APPOINTMENTS

As Deputy Director Medical (Reserves)
to date 1 December 1996
Surgeon Commander N R J Hooper
Flying Fox

As Medical Officer Coordinator Reserves) In the acting rank of Surgeon Commander
to date 1 December 1996
W M Luke
Scotia

As Deputy Director Medical Support Service (Reserves)
to the acting rank of Commander
J M Morley QARNNS(R)
President

To Surgeon Lieutenant Commander
G D Gardiner
Caroline

To Lieutenant Commander
J J Kennedy QARNNS(R)
Scotia

CONFIRMED IN RANK
Surgeon Lieutenant R W Harrison
Sherwood

REMOVED FROM ACTIVE LIST
Probationary Surgeon Lieutenant J P Cannon
Eaglet

RETIREMENTS
Surgeon Lieutenant Commander A L Joyce
President

Surgeon Lieutenant I R Jago
Eaglet

Lieutenant (MS) D P Taylor
Flying Fox

lassified Advertisements and Announcements In his last editorial [Vol 82 No 3 1997] the litor addressed the matter of maintaining the solvency of this Journal To this end as a service subscribers it is proposed to introduce in the next issue Classified Advertisements and nnouncements features

r a trial period classified ads will be accepted under the headings **Accommodation Available, commodation Wanted Job Vacancies, Jobs Wanted, Lucums Wanted For Sale, Property r Sale, Vehicles for Sale** It is proposed that all *private* advertisements will be charged at a flat rate £5 00 for a maximum of 30 words telephone numbers and post codes to count as one word ly

dditionally to the above personal announcements will be accepted under the headings **Births ngagements, Change of Address; Marriages** The proposed charge for these will also be £5 00 r a maximum of 30 words

rall advertisements/announcements accompanied by a cheque for the appropriate amount made ut to **The Journal of the Royal Naval Medical Service,** should be forwarded to

The Assistant Editor
Journal of the Royal Naval Medical Service
24 Beechcroft Road
Alverstoke
GOSPORT
Hampshire PO12 2ER

he Assistant Editor would also be pleased to receive any comments on the above proposals ncluding suggestions for additional classified headings

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- Breath hold timer

Micro Medical Limited

VOLUME 63
No. 2
1997

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Ocean Wave 1997
Fits, Faints and Funny Turns
Exercise Frozen Fields
Preventing disabling blisters
Successes in Commando Course

Journal

of the
Royal
Naval
Medical
Service



BAYER DIAGNOSTICS PRIZE COMPETITION

Royal Navy Medical Officers in training grades in general practice or hospital and other specialties are invited to submit a paper for The Bayer Diagnostics Prize Competition 1997. The final of this competition will take place at the Royal Society of Medicine, 1 Wimpole Street, London on the evening of 4 December 1997. Those entering the competition need not be members of the Royal Society of Medicine.

Each paper should be 10 minutes in duration, a further five minutes will be allowed for questions. Finalist papers will be judged by a panel assessing general, clinical, scientific and military interest; value of the hypothesis (if present); study design; scientific and statistical validity; background and references; originality; likelihood of influencing policy; quality of presentation and illustration.

The prizes will be awarded at a Reception immediately following the competition. The winner receives the Bayer Diagnostics Prize Medal together with a purse of £100. Five runners-up each receive cheques for £50.

Those wishing to enter the competition should send an abstract of their entry by 3 November 1997 to:

Surgeon Commodore I L Jenkins QHS FRCS Royal Navy,
Royal Defence Medical College,
HMS DOLPHIN,
Gosport,
Hants PO12 2AB

He will select two finalists from the Royal Navy to compete with counterparts from the other Services.

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ither the Min ry of Defence nor the Editorial Committee of the JRNMS accept any responsibility for
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Brigadier D V Nicholls, Commandant, RM Commando Training Centre, Lympstone, presents the Commando Medal to Surgeon Lieutenant E M Armstrong. Crown Copyright

The All Arms Commando Course is designed to equip officers and men of other services already trained in their own specialisation with the skills necessary to operate with the Royal Marines. It is held at the Royal Marine Commando Training Centre Lympstone in Devon. Each year a number of Medical and Dental Officers and Medical Assistants undergo this training to prepare them to meet the operational requirement. This summer four Royal Navy Medical Officers and a Dental Officer successfully completed the course. They were: Surgeon Lieutenants Greenberg, Maxwell Armstrong and Denholm and Surgeon Lieutenant (D) Tsoi.

Of particular note: Surgeon Lieutenant Armstrong was awarded the Commando Medal for the course having best demonstrated the features of Commando spirit. It is thought to be at least 20 years since a Medical Officer was awarded this medal.

The course has three phases: preparato y, individual skills and the commando course. T e two week preparatory phase teaches students t very basic skills required and prepares them f the very physical demands ahead. The individu skills phase is also two weeks long. During it st teach the individual skills required for commando course and assess the physic potential of students for the six week long fi phase. During the commando course studen acquire and improve critical military skills a must pass a series of criteria tests including 12 mile 68lb load carry to be completed wit four hours and culminating in a 30 mile mar carrying 22lbs and weapons to be completed eight hours.

ditorial

spect that from about a week after King Alfred med the predecessor of today's Royal Navy it been said that "There's no longer any fun in the vice !" Certainly today the pressure is on to ensure more and more work into the day but there many opportunities for challenge and adventure three contributors to this edition of the Journal istrate

John Gabb's account of Exercise Ocean Wave will excite fond memories for many readers—d envy in most others—of clinical challenges special camaraderies of the sea and the asure of new friends and exotic places. rgeon Lieutenant Suzanne Porter of *HMS don* braved days and nights of storm during oyage of some 500 nautical miles from the rmuda Triangle to Puerto Rico as she opered the prize crew put on board a ketch nd empty at sea.

ew will envy the opportunities for challenge ng sought by Royal Marine Corporal Alan mbers as he prepares for North Pole pedition 98. Royal Navy Medical Officers may be called upon to serve with the Royal Marines in such demanding circumstances congratulations are due to the latest batch to earn their Green Beret having passed the All Arms Commando Course and special mention must be made of the award of the Commando Medal to Surgeon Lieutenant Mac Armstrong. Is this a first in the history of the Royal Naval Medical Service?

Mention of history reminds me of questions which arose during transfer of items to the Institute of Naval Medicine from the museum and historic library in the former Royal Naval Hospital at Haslar. Among these items is a painting of a Mrs Bouchard and another of Surgeon Commander Horace Bryden Hill MRCP. It can only be presumed that these two people played a significant part in the history of that hospital or of the Royal Naval Medical Service but what that role was is not known to the new custodians. Perhaps you know the answer to these mysteries. If so the Medical Officer in Charge of the Institute will welcome your call!

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Updates

A good time to take stock



We are now at the end of the first year of the Defence Secondary Care Agency and the Defence Dental Agency. I have been in post as Medical Director General for six months and this is a good time to take stock.

All change is stressful and the formulation of four new agencies has been more stressful than many of us had expected. What the Defence Medical Services need now is a period of stability and a chance to adapt to the new order. You will all be aware that the government is conducting a Strategic Defence Review. This will be led by an analysis of our commitments. As I am quite convinced that the medical and dental services are already over committed, I am confident that we can anticipate being left to settle down with our new manpower complements.

I have plans to develop the headquarters organization so that it is better equipped to meet the operational requirements of the Fleet. We must never forget that we exist solely to support CINCFLEET and provide the medical support needed for the ships submarines aircraft and Royal Marines. The Defence Secondary Care Agency was formed to provide a training base so that our nurses, Medical Assistants and doctors will always be prepared to meet any eventuality. In time of peace they work alongside civilian colleagues in Ministry of Defence Hospital Units (MDHUs) and in the core Royal Hospital. But in time of war or other military operations they must be immediately available to deploy anywhere in the world at minimum notice and practise their medical and nursing skills often with very little host nation support. I am delighted that the Defence Medical Training Organization is basing the in service other rank training on the syllabus used for MA training. None of us could contemplate going to war without the support of the RN Medical Assistant who is the bridge block of the entire Service.

Just as important to the Fleet is the support given by the Institute of Naval Medicine. Perhaps most visible is the aid given to the submarine service and indeed the deterrent patrols could not continue without the assistance of INM. However without the work of the environment division many more sailors and marines would have collapsed with heat exhaustion or suffered the effects of hypothermia and cold injury. Occupational Medicine remains an attractive career option and is very much involved with looking after the patient in the workplace environment.

Research opportunities exist in both clinical care and occupational medicine. Good quality research and development enables us to push medicine closer to his limits and can produce a significant advantage in combat and times of stress. Publication is the natural output of research and I look forward to seeing high quality papers in peer referenced journals.

Primary care remains the lynch pin of all clinical care. Increasing civilianisation has produced new challenges and I am grateful to all of those whose duty rotas have increased post DCS

You are the first point of contact for the Service
n and woman when they are injured in action
t for many at sea Doc is the medical branch
ng not the Surgeon Lieutenant!

New opportunities for NVQs are being
eloped at INM It is crucial to our long term
re that our officers and ratings can leave the
vice able to get good jobs in civilian life
rdy all doctors now gain higher qualifications
art of their professional development Several
officers have gained MScs and other
lomas I issue a challenge to the GPs for
ieone to acquire Fellowship By Assessment
y now everyone should have had a pay rise
doctors and dentists are at last going to receive
anuings related pension as specialist pay has
n subsumed within basic pay giving a greater
tive to becom[illegible] LP
as practical

There are also generic opportu[illegible]ces
mil those who have recently left the Service With
the new Reserve Forces Act (RFA) the officers can
rejoin on a two year commiss on and s[illegible] RNR
officers have had the opp rtun ty to travel
overseas once more

I am glad of this opportunity to thank all of you
for your hard work and forbearance over the last
two turbulent years More progress needs to be
made and I will consult widely to ensure that we
move in the right direction

M P W H Paine QHS
Surgeon Rear Admiral
Medical Director General (Naval)

NDS Update - A Year of Agency Status

e Defence Dental Agency (DDA) is now two years
old having been launched on 1 March 1996
move to Agency status has proved to be a
ining challenge requiring a radical revision of
administration of primary dental care
vision In January 1997 the Headquarters of
Agency relocated from Lacon House in
don to the former Institute of Dental Health
Training at RAF Halton During the past year
administrative structures of the three Service
tal branches were dismantled and a Regional
nagement structure introduced The provision
dental care is now organised on a geographical
ional basis crossing Service and Command
ndaries Principal Dental Officers at Surgeon
mmander (D) or equivalent rank are responsible for
naging all the allocated primary dental care
ources within their regions and for conducting
audit and quality assurance necessary to ensure
t the Agency achieves its dental fitness targets
benefit of the Regional management systems is
ability to transfer staff to work at local dental
ntres of a different Service to cover temporary
nning shortfalls or to provide help when there
a particularly heavy demand such as
mediately before an operational deployment
The training of single Service ancillary staff
s also been rationalised and is now centred at the
DA Training Establishment Aldershot This
ngs all trainees into one location and into
mmon core curricula. The first tri Service
course began in October 1996 at DDATE
Aldershot The RAF dental hygienist trainees at
Halton already in courses moved to Aldershot to
complete training alongside the RN/RAMC
contingent in January 1997 The DDA Postgraduate
Institute formed up at RAF Halton its final intake in
1997 with tri Service training staff This facility
provides a base for postgraduate training and a
focus for specialist referral consultation and
advice

Agency status for dentistry in the Armed Forces
has been viewed in many quarters with a degree of
scepticism but change was inevitable The Royal
Naval Dental Service could not have survived as it
was The challenge is to live the vision to shape
the changes to suit the Branch and the Agency
rather than have unacceptable changes imposed
Agency status has indeed brought some
advantages to the RNDS An additional Surgeon
Captain (D) appointment to Principal Dental
Officer Region 2 (Scotland Lowlands) was
agreed and a dental Warrant Officer post within
the Agency HQ has been established
Opportunities for travel and working with the
other two Services have increased and Naval
dental officers have recently served in the
Falkland Islands Cyprus and Germany Such
appointments may not sound new to those with
long memories but in today's reducing forces
these are very worthwhile options The standard
opportunities for challenge and travel still exist

with dental officer completing the All Arms Commando Course and deploying in ships in support of operations worldwide The availability of postgraduate education remains excellent and with the Service Vocational Dental Practitioner Scheme now successfully launched cross-fertilisation of ideas and practice is well established Agency status has also brought with it the re-evaluation of many long established practices Measures are in hand to establish levels of dental morbidity in Service personnel This information will allow the correct allocation of resources leading to increased efficiency and a better service to our customers and patients

Many challenges lie ahead for the Agency and its personnel but if we are to survive in uniform these challenges must be met with enthusiasm and vision

John Hargraves QHDS
Surgeon Commodore (D)
Director Naval Dental Service

QARNNS Update

Following the signing of a Memorandum of Understanding between The Defence Secondary Care Agency and the Government of Gibraltar we are now a third of the way through the agreed period of collaboration with St Bernard's Hospital Eleven QARNNS are serving in either the Day Case Unit in RNH Gibraltar or the Primary Health Care Centre and the midwives are fully integrated into the Maternity Unit within St Bernard's During this period of uncertainty over our future in Gibraltar QARNNS personnel are maintaining a high profile by supporting the Command at events within Gibraltar and accepting the change with the flexibility and professionalism for which they are renowned We now wait to see what the future will bring in the way of provision of Secondary Care for our Service personnel and their families in Gibraltar

Since the last issue of this Journal HMS *Quorn* with which QARNNS is affiliated has had her rededication service at Rosyth Royal Dockyard It was a proud day for all concerned since it marked the end of a long period in refit and the return of the ship to the operational Fleet Since that date members of the ship's company have kept in regular contact and QARNNS from the Royal Hospital Haslar have had an enjoyable visit to the ship When HMS *Quorn* arrives in Plymouth for Navy Days it will be the turn of the MDHU Derriford to forge further links QARNNS personnel are hoping that this will further strengthen our affiliation between our ship and QARNNS personnel

In preparing to meet the future needs of the population served by QARNNS the Defence Medical Training Organisation (DMTO) is



seeking to provide a workforce of nurses able to function flexibly in an evolving service The demands well defined routes to accessible and innovative training leading to professional registration an academic qualification in nursing and continuing competence to practice There must be service-based learning with close integration of academic and clinical modules The Health Studies Division within DMTO under the direction of Lieutenant Commander M Bow QARNNS seeks to help staff achieve the train

gured by providing services for ill
the Defence Medical Services whether in
mary, secondary or operational roles
For some years pre registration nurse training
been provided through an association between
Royal Navy and the School of Health Studies
he University of Portsmouth which has been
arded the contract for this training on a tri
vice basis for 1997/98 Working closely with
National Health Service Executive for the
th and West Region DMTO has been
loring means of providing this training in the
ure It is anticipated that there will be keen
competition to win that contract On the
postgraduate front there is hope of a new degree in
Military Nursing to be taught by the Health
Studies Division as an accredited School of the
University which will award the degree

Overall QARNNS are still experiencing
turbulence and uncertainty of moving from refit
into the shakedown period but are on course for
smoother waters

PM Hambling ARRC QHNS
Captain QARNNS
Matron in Chief

'NAAFI IN PARTNERSHIP'

Reports in the Service Naafi are
unfounded Retail people tell
Naafi s profes nal and dynamic
organisation With its
value for money To achieve its
working in partnership with leading
particular business areas
expertise to help provide an unbeatable
service

In March Spar was awarded the
convert Naafi s 200 UK shops
class operation Newly refurbished
with longer opening hours will have a
extensive range of stock focused
customer needs

Naafi not merely content with
its clubs is going into the fast food business

In conjunction with Forest part
Compass Group full partnership
conducted to introduce a number of leading
branded foods to clubs for example Mama
Mia Pizzas and Not Just Sit Donuts

Other initiatives from Naafi include the
creation of Naafi Select Naafi s new mail
order catalogue and a new fun mail services
company Warrior Group Naafi Select offers
non food goods to Service personnel
worldwide through high street prices while
Warrior Group retail offers tailored those services
currently available through Naafi Financial
Services as well as many new products

The Armed Forces can be assured that Naafi
will continue to serve them and does not
plan to change its service ethos Naafi
remains committed to reinvesting profits into
the Service

Naafinews

J Royal Naval M[illegible]cal Serv[illegible]ce 1997 83 2 64–69

Adventure

The Mary Celeste mystery of Yacht *Ruth* of Flensburg

Suzanne Porter



While in passage with Ivor St Ellus Newfoundland to Naval Station Roosevelt Roads Puerto Rico operating with the Standing Naval Force Atlantic HMS *London* chanced upon a rather extraordinary find

Late in the afternoon of Saturday 5 July 1997 HMS *London* was 15 nautical miles ahead of the STANAVFORLANT fleet in an area of the North Atlantic most people know only as the Bermuda Triangle conducting engine optimisation trials during a maintenance day when a small object was first located on radar A slight alteration of course brought into sight a ketch wallowing in the Atlantic swell Our initial impression was that the small yacht was becalmed in these warm tranquil waters A closer inspection revealed that there was nobody on the upper deck the foresails and mizzen were neatly stowed but the main boom hung at awkward angle broken in two places there were mooring ropes trailing in the water and the main sail was in a rather dilapidated condition All the clues suggested that the vessel was in fact in some difficulty and so the seaboat was launched with a team to undertake an initial investigation

The First Lieutenant conducted this initial search from which it became apparent that the vessel was unoccupied and in fact had been so for some time initially thought to be in the region of six to eight weeks Due to the fact that the sails had all been neatly stowed the anchor was still attached to the foredeck, and all hatches were made fast if we

Surgeon Lieutenant Porter is currently appointed to HMS *London* as Squadron Medical Officer

b. eved that the yacht had broken free from her
ngs and she had probably been carried from
Azores drifting around the North Adantic on the
ailing currents Further in depth investigations
scertain her seaworthiness and habitability were
ertaken involving mechanics electrical
erts and the author (as Ship s Medical Officer)
the sun set over the horizon a very long night
incredible adventure were just beginning
tepping onboard for the first time was quite a
nge experience thoughts of what might be
den below soon chill through me Venturing in
rt in subdued torchlight we were greeted by
ose heat emanating from the cabin area, the
se of tiny feet as hundreds of cockroaches
tled out of the torchlight, and the repulsive
ch of decaying matter Dirty plates in the sink
exactly where they had been left food that had
n left in the fridge had solidified and was rotten
nd recognition an ashtray on the table,
eflowing with cigarette ash an opened book on
seat and next to it a couple of soft toys The initial
pression was one where the owners had gone out
expectedly and had failed to or had we just not
nd them!
The appearances all suggested that the yacht had
n at sea for some considerable length of time
likely several months This became even more
vious when a notebook was found (not a proper
book) whose last entry was dated 13 July 1996
ther found onboard suggested people had been
ng on her until the beginning of August 1996
ugh there after her whereabouts was vague and
gested that she had been drifting around the
ea for almost a year Passports of a young
man couple pointed towards the identity of the
ner owners German Authorities and Interpol
e informed and were soon on their trail A
ered Spanish courtesy flag and charts found
board made it likely that her last port of call had
n somewhere in the Canary Islands This black
lled yacht was an Aladdin s cave—packed to the
h with personal belongings ranging from
ling to electronics books oscilloscope and
n sewing machine this was *Ruth*
Amazingly the hull was intact and her bilges
re dry after all this time at sea There was
stantial damage to the steering gear with loss of
Windex Monitor helm and the rudder Informing
that *Ruth* had seen some rather inclement
ather over the past few months The main boom
s broken in two places and the main sail was
lly torn
A huge task lay ahead of us It took in excess of
ve hours to empty lockers and log all the items
that were on board and this was only the tip of an
iceberg An enthusiastic team of engineers repair
teams and cleaning parties worked through the
night in order to make Ruth as seaworthy and as
habitable as possible By first light on Sunday 6 July
1997 all cleaning and engine maintenance had
ceased and the engine now fitted with two new
batteries fired into life readily the water tank had
been drained finished and then filled with
chlorinated fresh water in ward off any remaining
gremlins It was now the turn of the shipwright to
make it completely new rudder and tiller with
plywood and angle iron, while the selected crew
members transported all the stores onboard in
preparation for spending up to a fortnight at sea
Everything was beginning to take shape we really
began to feel that we were winning the battle against
the clock so that we could get underway as soon as
possible Tension was mounting the crew were
eager to cast off though there were inevitable
feelings of excitement and anxiety amongst us as
well as scepticism from several people trying to
persuade us not to go

In true Royal Naval tradition, I was directed by my Commanding Officer Commander Iain Greenlees Royal Navy to take command of Yacht Ruth and to sail her to Naval Station Roosevelt Roads (NSRR) Puerto Rico by the most direct route taking into account prevailing wind and conditions I was honoured to have been given this opportunity

The crew was made up of a mixture of talent *Skipper* Surgeon Lieutenant Suzanne Porter RN (the author) 26 years a qualified RYA Dinghy Sailing Instructor and Senior Instructor and currently working towards my RYA Yachtmaster Offshore from Sale Cheshire *Mate* Chief Petty Officer(Radar) Glynn Williams 38 years a qualified RYA Dayskipper originally from Manchester now living in Torpoint *Navigator* Lieutenant Dong Dalena USN 26 years, a US Navy exchange officer a qualified RYA Competent crew from Bristol Connecticut *Engineer* Petty Officer (Marine Engineer Mechanic) Bill McGarry 36 years a qualified Coastal Skipper from Plymouth *Crew* Leading Seaman Shirley Carter 40 years from Faugnton with some sailing experience and Wren Operator Maintainer (AW) 1st Bartlett the youngest member at 21 years with a lack of sailing experience, from Kilbirnie Perthshire.

On the evening of 6 July 1997 at 1830 (2230 GMT) we said our farewells to *London* and embarked onto Yacht *Ruth London* detached from ms at 1900(2300GMT) at position 25° 56.6 N 062° 05.7 W in order to rejoin the STANAVFORLANT

squadron which had sailed on alternate nights moving past by *London* with most of the Ship's Company lining the upper deck cheering. We watched as she steamed south at high speed, the sun setting deep over the horizon. Our first night of adventure was just beginning: we could only wonder at what surprises lay ahead, but as *London* disappeared from view we all knew we were alone in an empty vast expanse of sea.

We had already set one of the jibs and the mizzen and were making a steady 3·5 knots on a heading of 230°(M). At 2020 the second jib (slightly larger than the first) was set and soon our speed had increased to 4·5 knots. The night passed quickly with the crew split into two watches working six hours about, and attempting to catch up on sleep when off watch which proved very difficult. The couches in the cabin consisted of bare wooden boards...each being softened by a blanket and the prevailing temperature in the cabin was almost suffocating. The cushions which had been on the cabin seats had to be ditched during the clean up operation. The weather stayed in our favour on this first night, with occasional showers being the only interruption to an otherwise starlit sky.

Everyone was pleased that Monday was soon upon us: the weather looked like it would remain fine for the next few hours there was a force four swell, wind was from an easterly direction at approximately fifteen knots. Our speed overnight had remained fairly constant at 4·2 knots and on our first twelve hours at sea we had logged fifty nautical miles. In accordance with instructions from *London* radio contact was attempted at least twice each day though we had no idea that our brief conversation with another STANAVFORLANT vessel, HMNLS *Witte de With* on that morning would be our last radio conversation of the trip. As the morning progressed the wind steadily increased, until we were cruising along on a beam reach at a comfortable five knots and as B discovered checking that she still had all her toes we had company. Two sharks decided to accompany us for part of the journey, swimming only about fifteen feet astern of us.

We continued on our course heading South South West and after twenty four hours we had covered one hundred and ten nautical miles. We had been running the engine intermittently during our passage so as to maintain the charge in the batteries, but also to make sure the engine did not seize up on us. It was a great surprise therefore when we could not get the engine to fire that evening. At this stage we still had sufficient electricity to be able to use the navigation lights and Global Positioning System (GPS) and all unnecessary electrical equipment was switched off to maintain sufficient power for the navigation equipment: this meant no cold drinks and our fresh food would not survive long in the heat of the day.

By 2200 that night the weather had begun to close in around us as we were in the midst of the most amazing electrical storms and the wind had continued to increase along with the swell which was now between six and eight feet. The mizzen was dropped as well as one of the jibs and we were still maintaining five knots on a beam reach. Unfortunately our power failed completely shortly after midnight, and our last known position was at 08 2 N 062° 20 2 W. By 0100 the sea state was a constant 5 with visibility down to about one mile. Around this time a light was spotted off on the starboard bow, and it soon became apparent that it was a large merchant vessel which was heading in our direction (we were seeing her port beam). We immediately illuminated *Ruth* as best we could using Cyalumes (chemical lights) at the masthead binnacle and on a trailing line astern to assess leeway and in case of a man overboard), and began signalling her with a halogen lamp to warn her of our presence. Eventually she sighted us, and realising that we must be in distress actually began to turn towards us. It was obvious when she approached that she was a large merchant tanker, the MV *Prateo*. After some expert manoeuvring in hazardous weather conditions the Master of the vessel positioned her so as to put us in the lee while we were able to come within about thirty feet of her and hail the crew. This enabled me to request that they contact *London* via the Inmarsat telephone to inform her of our situation that we were all well and would continue on our course to Puerto Rico: they were also able to give us a position from which we planned to sail a course of 200° so as to arrive hopefully in Puerto Rico.

Once satisfied we each turned our separate ways and once again we were alone. The storm continued all night with the wind remaining strong and from an easterly direction and sea state 4. Tuesday soon arrived and with it many ideas on generating electricity. PO McGarry set to have found a push bike on board (which had been put to one side during the clean up operations) and we took turns at trying to pedal in order to fire the alternator. Unfortunately this was not successful and we turned our attentions to other ideas which included anchoring fully and so we resigned ourselves to remaining without power until we hit land.

Soon after 1900 that evening when we were all about to eat the tiller suddenly lurched backwards

became detached from the rudder The problem only rectified by removing a bolt from the auto attachment on the stern We had all had quite igh excitement for one day As night fell we ed Cyalomes again so as to illuminate the ahead at least

Wednesday was thankfully a very peaceful day in parison to our recent excitement and it gave ryone the chance to relax Only Shifty eking disturbed the otherwise tranquil ironment - wherever he decided to sit he it on foredeck or aft in wave would always reach him when he took his turn at cooking (the cooker not on gimbals) the steak stew also took nge!

oon after midnight of 10 July 1997 a vessel was ted which we believed to be a fishing vessel s was later confirmed when at 0315 we passed ngh a group of five similar vessels Because of we believed that we had entered the North antional Current and Puerto Rico Trench or were north of it, because there are several pinnacles 0m above surrounding depths which may vide excellent fishing opportunities Based on and our estimated position we believed that we a still at least a further two hundred nautical es to run and it had been over forty nine hours e our last fix

rday soon arrived and the feeling on board was of mounting excitement to see land There was almost overwhelming feeling that we were ly there The day was very sunny and hot a dy easterly wind made certain that we ntained a good speed, and we felt reassured that Trade winds were blowing in our favour It was ng the afternoon watch when suddenly an idea got forward which boosted everyone's morale antly the HF radio had a battery! After nunting the current board for the GPS we naged to wire the battery to it and it was with t most disbelief that a position appeared on the en after a few minutes The first position that the S came up with was 24° 02.1' N 065° 19.4' W ich tied in with where our power failed. A second empt was successful and it was greatly isfying to find that after four days of dead koning estimating our position and speed we re a mere ten miles off track from the GPS fix! is fix put us on track to reach Roosevelt Roads on turday afternoon with nine hundred and five utical miles still to run

Land was first sighted by B just after midnight 12 July 1997 this we believed to be the US rgin Island of St Thomas. We reckoned that we d a further thirty miles to run before Isla de Culebra and Cayo Lobito hence we could ntinue to pate making our passage through the Barriers Passage in daylight (at night for safety we would have taken the Virgin Passage between Isla de Culebra and St Thomas) Our position was subsequently confirmed by sighting first the light of Cabo San Juan then the light of Isla Culebrita As we passed close to the northern coast of Isla de Culebra, we were greeted by a friendly dolphin who swam alongside us for a few moments before disappearing into the crystal clear waters

We negotiated the Barriers Passage mid morning on Saturday passing Cayo Batiquela (just showing at low tide) and transiting between Alcatraza and Los Gemelos then following the Pasa de los Cayos Lobo between Cayo Lobito and Cayo Lobo A little after 1630 on Saturday 12 July our great adventure was nearing the end of a chapter We moored *Ruth* at NS Roosevelt Roads Puerto Rico and we all felt that we had achieved something great The United States Coast Guard and the ice cold Coke that waited for us on the jetty were a very welcome reward after six incredible days of adventure

HMS *London* returned to NSRR Puerto Rico on 14 July to meet us It was a very welcoming sight when we pulled up alongside her and were greeted back on board with great enthusiasm. We had accomplished everything that we had hoped to achieve and more *Ruth* had finally completed her trans Atlantic passage, and was safely alongside as were her crew

Operational Effects of Salvage

The ensuing cost of salvage was considered minimal but the benefits of pooling resources expertise and working together to achieve our aim proved to be the most worthwhile experience for everyone involved The opportunity to undertake Adventure Training in the Royal Navy is always sought after Salvaging this yacht gave several people the adventure of a lifetime, allowing leadership skills to be put into practice this was the ultimate Adventure Training and I am sure that all people directly involved in the salvage will have learnt something valuable from the exercise

The cost of the salvage operation amounted to two seaboat batteries cleaning materials, two sheets of 12mm plywood 4m length of angle iron full tank of fuel and sufficient rations for a fortnight for six people

The Yacht

The Yacht *Ruth* was a Cullin Archer 34 Polar built in 1993 and registered in Flensburg Germany

Her length was 10.25m beam 3.33m with a Peugeot SMF36 engine. She was a two masted ketch with a black painted glass reinforced plastic hull teak upper deck and wooden bowsprit, having a Furuno 16/22 Radar on mizzen and Auto pilot ST 4000. She had been bought second hand at the beginning of 1996 by a young, married German couple in their early thirties who had sold most of their belongings to purchase her and we found out later that they had planned to sail her around the world.

Epilogue

Once we had disembarked onto *London* a crew of four were placed on *Ruth* to motor sail her over to the British Virgin Island of Tortola. *London* then payed a short visit to Tortola on 16 July to collect the crew and also to deposit the nine packing cases of personal belongings that had been off-loaded on to *London* initially.

It has since come to light that the young German couple are safe and well and are living in a small village in Germany. Believing their boat to have been stolen while they were in El Hierro, Canary Islands, they had submitted an insurance claim in late summer 1996.

Since our arrival back on board *London* public interest has been immense, promoting both the Royal Navy and STANAVFORLANT at home and abroad. This has been a wholly unexpected experience for me and one which I will remember for many years to come.

Exercise Frozen Fields 1997: A two-month training expedition in the Canadian High Arctic in preparation for the North Pole

Alan Chambers

Introduction

The Institute of Naval Medicine is playing a small part in supporting the North Pole Expedition 1998 in which two Royal Marines Sergeant Sean Chapple and Corporal Alan Chambers will attempt to be the first British men to walk unsupported to the North Pole from Canada. Their reports will assist INM in its ongoing work in support of operational commitments in extremes of climate.

Already Sergeant Chapple and Corporal Chambers have had a real taste of the challenges they will face as they have operated in North Norway and taken part in two previous cold weather expeditions including the Icelandic 500 expedition the first ever successful winter crossing of Iceland from the West coast to the East.

Unaided by animal or machine the duo will be totally on their own hauling all their supplies on two sledges each weighing 320lbs. A two man base team party will operate from the air mounting and recovery base at Resolute Bay on Cornwallis Island. The historic journey will take around 85 days to reach the Geographical North Pole and by the time the pair have reached their goal they would have hauled over 600 miles across the frozen Arctic sea. Polar North Patrons are HRH The Duke of Edinburgh Captain General Royal Marines and Major General D A S Pennefather Commandant General Royal Marines.

To rehearse all the procedures they will require next year evaluate their equipment and continue their training Sergeant Chapple and Corporal Chambers this year undertook Frozen Fields an expedition of 800 miles North of the Arctic circle. Included in their preparations was time at INM discussing cold survival and cold injuries and testing equipment (and refreshing themselves of intense cold) at temperatures down to –35°C in one of the cold chambers.

Corporal Chambers has written describing the experiences during the 800-mile journey of Frozen Fields 1997.

Field conditions and daily routine

Obviously our main problem so far North was the extreme low temperatures. Due to our previous experience combating the cold became routine and second nature. The morning routine at the overnight camp was spent preparing a time consuming breakfast filling four 1 litre flasks with hot chocolate for the day long haul and any final drying of face and head gear. Along with everyone's

un and packing away stores this morning
me would take aronnd two honrs Pull pole
pack away our camp then start the day s
ing.

We experienced many different types of Aretic
in from flat blue ice to pressure ridges fifteen
high and surrounded by rubble ice The degree
everity dictated onr speed The speed of onr
ement had different effects on the body Too
and we would produce too mnch sweat for the
hes to effectively wick away therefare
ning a thin layer of ice on the inside of the onter
ment The slower the movement the less
stnre prodnced and a more comfortable day s
fing was experienced

he night time rontine of cooking cleaning
firs medical problems communication
rednres and normal admin conld take
thing from three to fonr honrs This was the
st uncomfortable time having to sit in the
fined space of our tent We both suffered from
cr back pain because of this and I am now
king into purchasing a small fold away stool
a back rest to eliminate as much stress on the
er back as possible

ommodation

ommodation consisted of an easily erected
layer tent and was extremely comfortable
sidering the conditions we were experiencing
inside of the tent was purposely made from a
k mesh to help the team sleep during days of
longed sunshine/daylight This same model
will be nsed for next year My two main
cerns in the tent were carbon monoxide and
Due to the temperature being so low we had
lternative but to conduct all our cooking in the
Extreme care was taken while the cooker was
lit and proper ventilation was always nsed to
vent any build np of carbon monoxide We did
wever experience some small tent fires due to a
w back in Inel from the cooker once it was
ht this was unpredictable so we were always
pared for The only injuries sustained were a
singed eye lashes and eye brows

dical problems

experienced two principal medical problems
stbite and dehydration

Mild superficial frostbite to the finger tips was
erienced by both of us from the early stages of
expedition Dne to the work rate of hauling
vy laden sledges across hard packed snow and
the body perspires uncontrollably prodncing
excess amount of moisture which cannot be
wicked away from the body at an effective rate. The
build np of moisture between the hand and the
inner glove would freeze in a matter of three to four
minutes dnring any of our routine food and fluid
intake stops Only a small area of nerve damage
occurred however no skin blisters appeared
Redness followed by powdery flaking of the skin
later appeared around the affected areas Once we
had appreciated the risk we shortened our rest stops
to an absolnte mnimum and the hands were kept
active and the blnod supply to the extremities
pumping at a fast rate to prevent the freezing
Normal body heat re warming procedures were
carried ont to bring back the circnlation and colour
to the affected areas No permanent damage seems
to have occurred

With the working time increasing to seven
hours hauling a day our fluid loss exceeded our
planned intake The symptoms were not
noticeable nntil the late honrs of the night since we
were bedded down and resting Our daily fluid
intake was around four litres consnmed during the
course of the day s hauling We countered
dehydration by melting more snow at the end of
the night rontine and keeping the water in a
thermos at a warm temperatnre This enabled us to
have a substantial intake of fluid in the early honrs
Also our morning intake of hot drinks was
doubled to about a litre

Medical preparations for 1998

As further preparation for the 1998 expedition
Corporal Chambers recently attended a Patrol
Medic course at the Long Range
Reconnaissance Patrol School in Germany and
has decided upon the medical stores to be taken
He concluded Exercise Frozen Fields was to a
great degree a medical success with no major
medical problems or ailments occurring to either
of the party Hopefully next year we will be just as
lncky No doubt there will be problems of possible
cold injury and dehydration After recently
retnrning from the II RRPS Combat Patrol
Medical Course and starting to acquiring my
medical stores I have the utmost confidence that
the team s self discipline training and awareness
will override these potential injuries and
medically we will have a successful trip If
however we do need to administer any kind of
medication or perform any medical procedures I
am also confident that we will manage and be able
to stop any life threatening incidents

I would like to thank Dr L H N Oakley from the
Institute of Naval Medicine for his support and
advice over the dnration of our preparation

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Operational Medicine

Life on the Ocean Wave*

J H Gabb

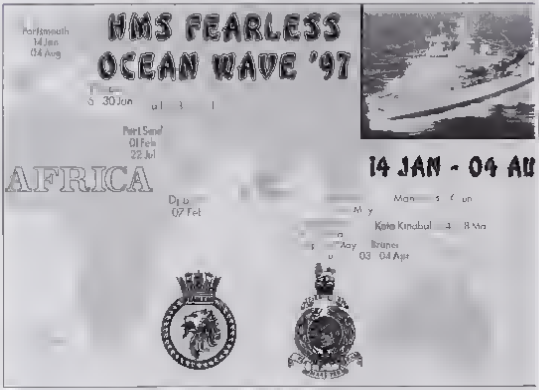


Figure 1 Portrait of HMS *Fearless* during Exercise Ocean Wave

HMS *Fearless* sailed from Portsmouth on Exercise Ocean Wave on 14 January 1997 and after a brief stopover in Plymouth to embark elements of 3 Commando Brigade RM, sailed as the command ship of the Amphibious Task Force (ATF) of which *Fearless* and the Landing Ships (Logistic) *Sir Geraint Sir Galahad* and *Sir Percivale* were the core. After a little over six months absence during which the ship steamed 27000 miles and deployed East of Suez for the first time since 1970 she will return to Portsmouth in 4 August.

For those unfamiliar with the Landing Platform Dock (LPD) there are two *Fearless* and *Intrepid* the latter is currently at 30 days notice for sea. The replacements the LPD(R)s *Albion* and *Bulwark* have been ordered and are due in service in 2001 and 2003. *Fearless* was launched in 1963 and will run on until her replacement is ready. Despite her age she continues to perform her role admirably as has been proved conclusively during Exercise Ocean Wave 97 during which every exercise and

Surgeon Commander Gabb is currently Principal Medical Officer HMS *Fearless*

* *A glossary of abbreviations is provided on page 75*



re 2 Medical and dental staff of HMS *Fearless*. From row (left to right) POMA P Richardson Sup Lt D K Wallace Cdr J Gibb CPOMAN Whiteley
k row (left to right) LMA A Speight LMA(Q) J Harper LMA T Smith MA(Q) A Bradley LMA A Watts

ning commitment has been met. She has hasted to conduct dock operations 37 times mpleted some 450 hours of amphibious surface rations and well over 500 hours of helicopter ng including 1500 deck landings. Of the 203 vs spent away 138 have been at sea and we have de 12 port visits (*Figure 1*).

The ship's complement is 540 (50 females) the is shaft, belonging to the Marine Engineering partment, the LPDs being with HMY *Britannia* and RFA *Olna* the last steam ships in the yal Navy—and MEM hungry! When borne, the barked Military Force (EMF) can swell the mbers to over 1000. During Ocean Wave 97 this ire was approached with 40 Cdo RM HQ 3 n Bde RM Commodore Amphibious Warfare (COMAW) and elements of 845 846 and 847 Naval Air Squadrons embarked for long periods.

The Medical-Dental Department, sited at 1 Deck/Flight Deck level is compact but boasts three offices, a 4 bunk ward/waiting room/rest room(!), a treatment room, dispensary and dental surgery. With a Surgeon Commander GP as PMO Surgeon Lieutenant (D) (DENTO) CPOMA POMA and five MBJRs, it is stuffed to provide sufficient medical manpower in hostilities. In such times the Sick Bay becomes the tasking Medical HQ (MHQ1) run by the CPOMA with DENTO relocating to a secondary backup position (MHQ2). Four First Aid Posts are manned, each by a MBJR and a first aid party of Supply and Secretariat personnel. PMO DENTO and POMA are tasked as

required The Medical Organisation for Action does not provide for ASTor SST treatment the aim being to resuscitate stabilise and speedily evacuate casualties to a second line medical facility

Having waved goodbye on 14 January to some hardy families on the Round Tower at Portsmouth to the music of a RM band we arrived in Plymouth in fog so dense it prevented the staff of Flag Officer Sea Training coming on board! Having embarked the EMF we had to transit most of the Mediterranean before seeing a harbour again arriving at Piraeus 10 days later The passage was marked medically by a general exchange of upper respiratory tract infections and a blitz on Havrix vaccination in anticipation of many *fruits de mer* meals to come! Gibraltar and the Atlas Mountains were scarcely visible in the gloom but by Sicily the weather front was looking up

Our first casualty occurred a few hours before we arrived in Piraeus a Leading Chef contriving in such a unique fracture dislocation of his ankle This was reduced under general anaesthetic at the Greek Naval Hospital in Athens by an orthopaedic surgeon who had spent a year of his training at the Birmingham Accident Hospital Transit through Suez and an exped of 600 trippers to the Pyramids passed off uneventfully but as soon as we were away from Suez a Wren rating presented with abdominal pain requiring management by Nil by Mouth IV antibiotics and IV antibiotics for 72 hours her symptoms resolving without further incident An overnight stop in Djibouti allowed a visit to the French Military Hospital for x rays and blood tests and the first meeting of the four doctors of the Amphibious Task Unit who dined together on *Fearless* Brinsdon and Gabb of the Royal Navy and Willson Pepper and Wykes of the Royal Fleet Auxiliary

Into the Arabian Sea with sunbathing tugs of war pancake races on Shrove Tuesday quiz and film nights to fill the leisure time while the ship went about the daily business of SSE/FEXs man overboard and other Officer of the Watch drills flying machinery breakdown drills and so on The EMF busied themselves with twice daily fitness training and a series of jungle acquaint lectures On arrival in Goa on 16 February we had to send home an acutely unhappy sailor for psychiatric assessment

The First Sea Lord paid us a visit in Goa an excuse for at least some to enjoy breakfast in the morning sun on the 30mm Deck Goa also produced our third and fourth aeromed casualties one a hand fracture and the other a severe soft tissue/neuropraxia injury to the arm sustained off dinty as he was dragged through the water behin a speedboat with his wrist trapped in the hand hol of a rubber ring from which he had just be ejected! A bizarre injury from which he has been upgraded P2 five months later

Across the Bay of Bengal through Malacca Straits and into the South China Se Brunei for a brief stop over at Maura to off l the EMF This gave me an unexpected delightful opportunity to re visit my old prac 11 years on! Newly accredited Royal Navy C should mate this is one of the best appointments still available The Royal Bru Yacht Club at Ser ia was the unlikely venue f spontaneous meeting of no less than three Ro Navy doctors (Campbell Brinsden and Ga and three Royal Navy dentists (Wallace Al and Jordan)

Having left the EMF in the jungle for six wee *Fearless* moved around the corner to K Kinabalu (formerly Jesseltown in British Nor Borneo) which lies under the apron of Mo Kinabalu at 4101 m (over 14000 feet) the high mountain in SE Asia The route in the ship is well trodden and Ken Wallace (DENTO) Neil Whit (CPOMA) and Alex Speight (LMA) added to list of its conquerors KK proved a great succ with excellent beaches and snorkelling wh water rafting the mountain and the v hospitable yacht club there can be better places to sit drink a beer and watch the an down!

Friday 14 March saw the visit of King Nepo and his Court who called many in aeronaut their misdemeanours the punishment being disgusting tasting morsel from the depths an variably severe ducking And so to Singapore the first of three visits March sport was play against local teams HQ 3 Cdo Bde RM COMAW staff joined and we said goodbye t aeromed patients 5 and 6 heading home by with a nastily fractured big toe (which will le him not to kick industrial containers in futu and a proven case of paraceratus The all m squash team enjoyed an excellent post ma evening at the Singapore Cricket Club wh helped to ease the ignominy of losing 5 0 w three of the defeats at the hands of th Singaporean ladies who were stunning both looks and squash skills

Easter Sunday saw us re embarking the E at Mnara and thence into the major amphibi exercise of Setia Kawan 2 involving a substan slice of 3 Cdo Bde RM and the Royal Bru Armed Forces and culminating in

ambitious landing demonstration in front of the Sultan of Brunei Whilst *Fearless* had been spared any medical horrors to date 40 Cdo were having quite a torrid time in the jungles of Brunei mainly with heat related illness and more allergic reactions to a variety of bites and stings from scorpions snakes centipedes insects and the like During the helicopter transportation of one such casualty the downdraught from the rotor blades of a Sea King 4 detached a large piece of tree which fell to strike and injure a Royal Marine below

With Sultan Kawan the resounding success behind us and the HMS safely back on board the ship set off once more for Singapore for a 3 week Amphibious Base Assisted Maintenance Period a major drafting (personnel posting) window and opportunity to take 10 days leave About one third of the ship s company chose to take this leave and many flew wives husbands and children from the UK for an unforgettable holiday both in Malaysia Thailand Singapore or Australia the more adventurous Australia New Zealand and Vietnam Coming as it did halfway through the deployment it was a timely and very enjoyable break

Britain still has a Royal Naval presence in Singapore owning some jetty space and facilities at Sembawang dockyard close to the old HMS *Terror* It is looked after by the Resident Naval Liaison Officer (RNLO) and for the duration of April and May he was assisted by Asst RNLO (Medical) in the shape of CPOMA Patton on loan from the Royal Hospital Haslar With most if not all of the Ocean Wave 97 ships visiting Singapore during this period, this proved to be a invaluable appointment Secondary care was not a problem as the English and friendly services of the private hospitals in Singapore were available although in these were to be kept to a minimum in view of the steep charges You might be able to see a consultant of your choice on the day of asking but at a price!

For *Fearless* this visit coincided with aeromeds 7 and 8 a large recurrent incisional abdominal hernia and a (probably longstanding) pelvic prolapse of the structure Both patients were subsequently operated on at the Royal Hospital Haslar

May saw more amphibious training this time with the Malaysian Armed Forces during which a man with appendicitis was flown off to Singapore for operation and a Royal Marine with a just recovered family history of obstructive cardiomyopathy was flown home for cardiological assessment aeromeds 9 and 10 A visit from the mobile Operational Sea Training Team (OST) preceded a visit to Kuantan, the former being memorable by the OST CPOMA becoming a Safeguard casualty having come into contact forcibly with a pump part during essential Malaysian style maintenance which saw the departure of aeromed 11 with an acute meniscal tear and locked knee unlocked prior to aeromedevac by on board manipulation

June brought a third visit to Brunei a further off load of the EMF a second visit to KK (see another account of the mountain) and aeromeds 12 and 13 one dislocated elbow and an acute PID Two memorial services were held during the month the first over the graves of HMS *Repulse* and HMS *Prince of Wales* which were sunk off E Malaysia in 1941 with the loss of over 900 lives and the second on 14 June the anniversary of the sinking of the landing craft Foxtrot 5 in Sea Carlos Water in 1982 with the loss of five lives Poignant moments which reminded all of us of our reasons d être

Manila in late June was regarded by many as the best and most traditional run ashore of the deployment This preceded the gathering of all the diverse fleeting elements of Ocean Wave 97 for an exercise three the handover of Hong Kong on 30 June an occasion marked on board *Fearless* some 70 miles off Hong Kong by old China hands gathering at 2355 to drink a toast to our former colony whilst listening to the BBC World Service our only media contact with the outside world! The following day all ships present formed into two columns in line astern and Cheered ship as HMY *Britannia* with HRH The Prince of Wales and HE Mr Chris Patten the last Governor of Hong Kong onboard sailed between the lines under the watchful eyes of a Chinese AGI To follow HMY *Britannia* up the line was obviously more than her Captain dared!

Ahead brief stopover in Singapore to off load the 40 Cdo RM bound for South Africa, coincided with the last three aeromeds a back injury an internal derangement of knee and most interestingly an acute optic neuritis All 16 aeromeds were evacuated most efficiently by HQ 38 Group RAF based at High Wycombe who provide a very willing helpful and efficient world wide service

And so on 6 July we slipped from Sembawang and headed for home retracing our route across the Indian Ocean and Arabian Sea, latterly in the company of HMY *Britannia* and RFA *Olna* with whom we coeducted the last 3 steamship RAS in the history of the Royal Navy Back through Suez and into the relatively familiar waters of the Mediterranean, the ship s company enjoyed a spiritually uplifting visit to the Holy Land via Haifa.



F [illegible] HMS *B* [illegible] with RFA *L* [illegible] and M [illegible] Ocean Wave Bonaventure in the background

Medical reflections

As I write, the Mediterranean is behind and the Bay of Biscay looms. It is noticeably cooler! Sunday will see us off Plymouth embarking sons and daughters before a hurried rush up the Channel to Portsmouth and a traditional welcome on Monday 4 August. It is time to reflect on the medical experience of the medical and dental department during Ocean Wave 97.

Particularly with an EMF there are plenty of patients to be seen on such a deployment up to 30 a day by the medical staff as a whole, providing a good range of clinical experience for the MBJRs. Six monthly rotations through MHS Treatment Room, Stores and Ward/Dispensary also gave them a good grounding in preparation for a draft to their own single-handed medical departments afloat as Leading Hands and Petty Officers. A sample of the more interesting cases seen in addition to the aeromedevacs, include a Parkinson's, acute lobar pneumonia (with progression through all the classic text book signs), a Bartholin's abscess, three partial ulnar nerve palsies and a pair of cases of interest to both the medical and regulating branches. Of particular interest was an outbreak of a flori bilateral markedly haemorrhagic and clinical bacterial conjunctivitis amongst 40 Cdo RM who ashore in Peninsular Malaysia in May. Thirty of these men affected were evacuated to *Fearless* all getti within a week with diligent application of chloromycetin eye drops and ointment. Regular assessment showed that the infection remained entirely superficial and was not threatening to the eye. Just as we thought we had well and truly se the back of it it broke out again this time among t Royal Marines of 4 Assault Squadron RM on boa *Fearless*. The clinical signs were identical and outcome and management the same. In all some people were affected between 26 June and 12 July and the outbreak did not end until most of t equipment and stores belonging to 40 Cdo RM w off loaded in Singapore. Unfortunately being sea for the periods in question it was not possible t culture the organism. The only other outbreak w



ure 4 The last 3-streamship RAS for the Royal Navy

robable Staph aureus enterotoxin food poisoning nch struck down nine officers in the space of two urs with acute diarrhoea and vomiting. Anthra ad was thought to be the likely infecting medium, I made an uneventful recovery

ghlights

what have been the highlights of exercise ean Wave? First and foremost the privilege and asure gained from working with a highly ofessional and committed team both in and out the Sick Bay. It is something which is perhaps rticularly apparent in the close community of a p or commando unit. There is certainly in my perience no better place to learn what the Royal vy is about and how it works.

What else? A snapshot would include the ropolis in Athens, the Pyramids, Sphinx and iro Museum, the third world poverty so evident Djibouti, the beautiful unspoilt beaches equisite old white Vanguard taxis and eadily people of Goa watching old style cricket m the veranda of the Singapore Cricket Club ing the sun go down over the South China Sea Kota Kinabalu, and watching the sun rise over owes Peak and Guilly nt the top of Mount onbalin the Hawker food stalls in Singapore; Pacific War Memorial on Corregidor Island off anila and whichever country we visited the ignant reminders provided by the Common ealth War Graves Cemeteries such as Kranji at we are merely following in others' footsteps t in very different circumstances. How munate we are!

Acknowledgements

My thanks go to Captain M S Williams Royal Navy Commanding Officer HMS *Fearless* for nllowing me to submit this article to LA/Phot P James for the excellent photographs and to RPO M J Harris for the splendid map of our voyage. Also to the staff of the Aeromedical Evacuation Unit at HQ 38 Group RAF, those at the Royal Hospital Haslar who have so willingly provided telephone advice and accepted our casualties, my colleagues on other ATU ships and mates and above all to my own Sick Bay staff all of whom have played a part in making Life on the Ocean Wave a thoroughly enjoyable and professionally rewarding experience.

Glossary

AGI	Advance Gatherer of Intelligence (ship)
ATU	Amphibious Task Force
Cdo Bde	Commando Brigade
CPOMA	Chief Petty Officer Medical Assistant
COMAW	Commodore Amphibious Warfare
DENTO	Dental Officer
EMF	Embarked Military Force
MBJR	Medical Branch Junior Rating
MEM	Marine Engineering Mechanic
MHS	Medical History Sheet (medical records section of a Sick Bay)
PMO	Principal Medical Officer
POMA	Petty Officer Medical Assistant
RM	Royal Marines
SSEP	Standing Sea Emergency Party
SST	Surgical Support Team

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Clinical management

Fits, Faints and Funny Turns

W M Edmondstone

Abstract

Episodes of alteration of consciousness are a common reason for referral to hospital. This article discusses the differential diagnosis with particular emphasis on the first epileptic seizure. It stresses the importance of an accurate witness history and the comparative lack of value of investigations.

Introduction

About 5% of the population have a seizure at some time in their lives and there are approximately 60 000 first seizures each year in the UK[1]. Many episodes of unexplained alteration in consciousness are due to causes other than seizures, including syncope, psychogenic attacks (pseudoseizures), transient ischaemic attacks, basilar migraine, narcolepsy and hypoglycaemia. For the patient such an episode is profoundly worrying. The diagnosis of an epileptic event carries unfortunate consequences: the term still carries a stigma in society and may jeopardise the patient's career his ability to drive and to take part in certain leisure pursuits, and has implications for insurance and mortgage proposals. Moreover the attack generates many other anxieties including worries about causation the likelihood of recurrence and the possibility of sinister intracranial pathology.

The role of the clinician is to advise the patient as accurately as possible but to do so requires an accurate diagnosis. The diagnosis is clinical, based on a detailed witness history of the events before, during and after the attack. It is essential to avoid diagnosing epilepsy without incontrovertible clinical evidence. A premature and inaccurate diagnosis can be gravely damaging to a patient and if there is any doubt it is preferable to resist the temptation to attach a label and to await the passage of time and further events[2]. In the Service environment this may be easier said than done and there may be considerable pressure to make a definite diagnosis at the outset.

Surgeon Captain Edmondstone is Head of Medicine at Royal Hospital Haslar.

Differential diagnosis

A witnessed tonic clonic seizure accompanied incontinence and tongue biting and followed headache confusion and muscular aches sho present little difficulty in diagnosis. M witnesses however will never have seen a seiz before and may be selective in their recall of event. The F/Med/138 is a useful questionn which helps to elicit a more comprehens description of the event than a free history should ideally be completed by all witnesses soon as possible after the event and sho accompany any subsequent hospital referral. If form is unavailable it is essential that the nam and points of contact of witnesses are recorded that they can be interviewed later. Not only is history crucial for the diagnosis of an epilep seizure it is also vital to identify any focal elem to the attack since this may point to an underly structural lesion. The seizure may start as a fo convulsion which spreads to become generali (secondary generalisation) or it may remain fo throughout. Examination after the attack n reveal focal signs. These are of prognos significance and hence must be sought recorded.

The two conditions most commonly confu with epileptic seizures are syncope psychogenic attacks. Many apparent seizu referred to hospital are syncopal attacks wh have been complicated by myoclonic twitching jerking. It is well recognised that convulsions a result from cerebral ischaemia if fainting patie are kept upright, but it is not generally apprecia that epileptiform phenomena frequen complicate simple faints. Induced syncope in healthy volunteers resulted in myoclonic activity lasting up to 16 seconds in 90% and in 60% th were visual and auditory hallucinatio However syncope is rarely unprovoked there usually a history to suggest postural hypotensi cough or micturition syncope or evidence cardiac disease or dysrhythmias. Neurogenic

ovagal syncope can usually be identified if
l e is an obvious substrate for the attack such as
unpleasant experience or a hot and stuffy
nvironment The symptoms preceding the faint
ally include visual dimming faintness nausea
sweating Recovery is usually rapid and
wsiness confusion headache or muscular pain
anusual

Psychogenic attacks or pseudoseizures
quently coexist with epilepsy and may be
ficult to differentiate from it Anxiety or panic
cks may be accompanied by hyperventilation
ich may lead to symptoms of depersonalisation
mbling partial complex seizures Emotionally
ed attacks mimicking epilepsy may take the
m of swoons tantrums deliberate simulation
epileptic seizures and abreactive or symbolic
cks These last attacks described as a
cabre pastiche of intercourse are particularly
n in women who have been sexually abused
l feature breath holding back arching pelvic
sting self injury and thrashing of the arms and
s[4]

Clinical features of pseudoseizures which help
differentiate them from epilepsy include
istance to passive movements of the limbs
sistance to attempts to open the eyes and flexor
ntar responses In a genuine epileptic attack the
pils are dilated and the eyes may be deviated If
patient is rolled onto the opposite side the eyes
l remain in the previous position whereas in a
ilated attack they may turn towards the floor
l the pupils react briskly to light Pseudoseizures
ely occur without an audience attacks may be so
quent and dramatic as to require nursing on a
oor or on the floor and recovery from attacks is
id[5] The serum prolactin is characteristically
vated after major epileptic seizures and can be
eful but it is essential to take a baseline sample
comparison[6]

Primary care

part from basic first aid including maintenance
the airway and protection from injury the most
portant actions which can be taken by the primary
e physician after a possible seizure are to
amine the patient thoroughly with particular
ention to focal neurological signs to check the
od sugar to identify and question closely any
nesses (see above) and to consider the
ssibility of alcohol and drugs About 30% of
t seizures are related to alcohol[7,8] Many
tients are then sent to hospital although
nission is usually unnecessary if the patient has
covered fully and has support at home. Service
personnel should be medically downgraded after
any episode of unexplained loss of consciousness
Patients should be warned not to drive and to
inform DVLA which will require them to avoid
driving for one year (on the basis that if an
epileptic cause cannot be excluded there is a
continued liability to further attacks)

Secondary care

If not admitted virtually all patients are
subsequently referred for investigation Most
patients and many doctors believe that
investigations can identify the nature and cause of
a funny turn It is expected that a battery of blood
tests a CT brain scan and an EEG will be done and
that the results will be meaningful In fact the yield
from investigations is so disappointing that it is
debatable whether any are worthwhile An audit of
56 patients admitted to Haslar in 1990-93 after a
witnessed first generalised seizure found that
blood tests were done in most but gave useful
information in none although abnormalities of
MCV and liver function were seen in a number of
those clinically identified as alcoholic[8] This
finding was consistent with the Royal College of
Physicians study of first seizure[9] Nevertheless
blood tests are cheap and may occasionally throw up
unexpected findings An ECG is worthwhile to
identify a pre excitation syndrome or prolonged
QT interval as cardiac dysrhythmias can
sometimes present as an unexplained alteration in
consciousness

Although 20–34% of CT scans are abnormal
after a first generalised seizure in adults most of
these abnormalities are not clinically relevant
Moreover only 6–10% are abnormal if there are no
focal neurological signs[9] and false negative CT
scans are not infrequent in patients with
tumours[10] Despite its limitations most clinicians
continue to request CT after a first seizure and the
reassurance to the patient of excluding a space-
occupying lesion cannot be ignored even if it may
be misplaced There is no doubt that MRI has
better diagnostic accuracy than CT and it is the
imaging modality of choice where it is available

As a diagnostic test after a funny turn the
EEG is useless—although it is still routinely
requested in this situation Even if there is
diagnostic confidence that an event was epileptic
the value of the EEG after a first seizure remains
controversial The sensitivity of a waking EEG
after a first seizure is only 7–11%[10,11] and the
Royal College of Physicians study concluded that
there is no justification for recording an
electroencephalogram after an initial seizure in

adults.[2] It may however be useful in predicting recurrence the risk being doubled in those with generalised spike and wave activity compared with those without although as a predictor it is no better than a sibling history of epilepsy

Risks of recurrence after first seizure

Many studies have looked at the recurrence rate after first seizure but most suffer from selection bias having studied hospital based cohorts A large general practice study showed that the risk of recurrence was 62% at one year[1] rising to 72% after three[13] From the Service point of view this has implications for the length of time an individual is downgraded after a first seizure Although most of those destined to suffer recurrence will do so within the 12 months they are downgraded P7R a few will experience a second seizure beyond this time Whether those who have remained seizure free at the end of 12 months should be upgraded is a matter of judgement In some occupational groups, for example aircrew divers and submariners a solitary seizure is incompatible with further employment in that capacity Generalised spike and wave activity on the EEG or some other high risk occupation would suggest that a more prolonged period of observation in a reduced category would be indicated In this case the patient should be referred to a Medical Board of Survey As far as driving is concerned DVLA allows restoration of an annual licence one year after a first seizure provided there has been no recurrence If the EEG shows persistent 3/second spike and wave activity the epilepsy regulations apply but these now allow a return to driving provided that there have been no attacks during the intervening year

Treatment

In this country treatment is rarely offered after a solitary seizure although this is routine practice in the United States Evidence is now accumulating that early treatment may reduce the recurrence rate and in a multicentre study of 397 patients treatment halved the risk of second seizure at two years [4] Although the consensus at present is that there is insufficient evidence to recommend treatment for most patients there will be some individuals who after full discussion of the facts opt for anticonvulsant therapy

Conclusions

Despite pressure from the patient and his employers for a diagnosis cases of unexplained loss of consciousness cannot, by definition be given a label, nor is it in the best interests of the patient or the Service to do so However such cases should be dealt with as for epilepsy the patient downgraded for one year (or more in certain cases) and advised to notify DVLA and to avoid driving Investigations cannot explain what the event was, nor are they generally very helpful The single most important piece of diagnostic information is a comprehensive and accurate description of the events before during and after the attack by a witness This information should whenever possible accompany the referral of such patient for specialist assessment. Should diagnosis remain elusive despite further investigations then patients should be referred to a specialist centre for ambulant EEG monitoring and video telemetry A therapeutic trial of anticonvulsant drugs is rarely if ever justified

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A udit

A udit of blister prevention during New Entry (fficer Training in the Royal Navy

F A Ross and Denise Hughes

I roduction

I ver limb friction blisters (blisters) have f gued military campaigns and training for f nturies and remain the cause of considerable r bidity today[1,2]. Perhaps more importantly v can result in significant losses of expensive l itary training time. Service men and women p loy a variety of measures based on individual d corporate experience to prevent blisters ere does not however appear to be a v rsally accepted optimum method for v venting blisters in military populations and the de variety of theories on blister prevention is ggestive of i complex underlying aetiology r rrent understanding of blister pathogenesis is b sed on research carried out in the 1950s and 60s a l little recent progress has been made despite b hnological advances in material science and p oduction[3–9].

An audit was undertaken to determine the s ent of the blister problem at Britannia Royal N val College (BRNC) Dartmouth and to assess t impact of the introduction of various blister v ention measures. The measures implemented re all deemed to be common sense measures h her than scientifically evaluated techniques of p ven value and were based largely on the e vious experience both personal and clinical of e of the authors.

The subjects of this audit were all New Entry fficer Cadets in three consecutive terms tending BRNC for initial naval general training. ch term lasts 14 weeks and the emphasis of the st six weeks is on leadership and physical ness. This initial phase culminates in the actical Leadership Exercise (PLX) which is rried out on Dartmoor during week 6. PLX is a nelling three day exercise during which large weights in the form of personal rucksack and team items are carried on long marches very little sleep is allowed and time for personal administration is extremely limited. The ground is rough boggy moorland terrain rough tracks and metalled roads. Not surprisingly a large number of blisters occur during PLX and Officer Cadets can lose considerable training time while recovering from these blisters and their complications.

Methods and interventions

The first entry audited (Term 1) joined in April 1996 and comprised 96 males 13 females and seven males from countries other than the United Kingdom (Internationals) a total of 116. This entry were not given specific advice on blister prevention from the Sick Bay and took whatever measures they deemed sensible. Term 1 is the control group. The weather during PLX was hot and dry.

The next term (Term 2) joined in September 1996 and comprised 138 males 74 females and 20 male Internationals a total of 182. On joining a specific blister prevention briefing was given by the Principal Medical Officer and each Cadet received an advice leaflet for future reference. The information in the leaflet included advice on breaking in boots socks the use of surgical spirit to harden the skin and advice about foot care in the field with strong emphasis on the need to keep feet dry and to regularly reapply talcum powder. Cadets were advised to wear socks made from natural materials. Advice was also given about the use of zinc oxide tape and it was recommended that this should be applied prophylactically to areas prone to blistering the heel and the ball of the foot. The leaflet also contained information on the treatment of simple blisters. Supplies of zinc oxide tape were made freely available. The weather during PLX was cold but dry.

The final term (Term 3) joined in January 1997 and comprised 93 males 23 females and seven

rgeon Lieutenant Commander Ross is the Principal dical Officer at Brittania Royal Naval College rmouth. Mrs Hughes is a Practice Nurse in the Sickbay

male Internationals 123 in all This entry were sent a leaflet a month before joining BRNC and this recommended the regular use of surgical spirit to harden the feet It was also suggested that moisture vapour permeable socks (MVP socks) and loop knit socks would be a good investment prior to joining Sorbothane insoles were also suggested as a possible means of preventing lower limb injuries These are not normally issued for the purpose of preventing blisters

On joining Term 3 were given a detailed clinical presentation on blisters including a slide show of severe blisters They were also issued with the foot care leaflets as used in Term 2 and individual bottles of surgical spirit to encourage continued tanning of the feet. Zinc oxide tape was made widely available Prior to PLX all the Cadets were briefed again on foot care and prophylactic taping with zinc oxide was recommended and demonstrated This policy was adopted College-wide for Term 3 as it was apparent during Term 2 that various sources of contradictory advice were active in the College An upper limit for rucksack weight was also agreed with the training department and set at 23kg Conditions on PLX were cold and extremely wet

Data were collected daily from the Sick Bay log for all patients presenting with blisters Site, size number and severity of blisters were not recorded Instead it was decided to assess the number of days of normal training lost as a result of blisters A normal training day was defined as one in which an Officer Cadet did not require to attend the Sick Bay was fit to wear normal uniform including boots and to carry out full duties including physical training and drill Thus a blister sufferer who attended Sick Bay t treatment and was then excused boots for a furth three days was deemed to have lost four days normal training In all cases the minim possible restrictions were awarded by the S Bay staff (total staff six) Blister sufferers w treated themselves and were able to perform th duties do not appear in the study figures Patie who developed complications from blisters su as cellulitis and who required admission to Sick Bay had these days counted as training d lost due blisters Most excused Cadets were to perform some useful training by attend lectures

To determine which if any of the elements the blister prevention package were responsi for reducing days lost from blisters an anonym questionnaire was given to Term 3 to try to ass which if any of the various recommend measures had been used

Results

The three study populations were broadly simi and the training given in each term is essentia identical The actual blister incidence is unkno as the study depended entirely on cad presenting themselves to the Sick Bay and th are a variety of possible confounding elements this aspect of behaviour Individual variations previous experience of blisters hill walkin previous military service or amount of sp played are confounding factors for which correction has been made It has been noted th International students are seldom affect by blisters

A 3 x 2 contingency table was construct allowing comparison of all three terms with t

Table 1 Summary of Interventions

Term 1	*Term 2*	*Term 3*
Zinc oxide tape available if requested	Initial brief on blisters	Pre joining leaflet recommending MVP socks tanning and Sorbothane insoles
	Foot care leaflet	Detailed initial brief
	Advice on socks powder tape and surgical spirit	Foot care leaflet
	Zinc oxide tape freely available	Issued with surgical spirit Zinc oxide tape freely available
		Foot taping demonstration and repeat brief before PLX
		Upper weight limit imposed

Table 2 Summary of Results

	Term 1	*Term 2*	*Term 3*
T l l ke	116	182	123
A rage age	24 7 years	23 6 years	23 05 years
T l training days lr lhrough blisters	208	179	110
T l possible t ng days	11 368	17 567	11 944
N ber of Cadets t ted for blisters	61 (52 6%) Males 54 Females 7	57 (31 3%) Males 46 Females 11	40 (32 5%) Males 32 Females 8
A rage days lost p cadet w th b ars	3 41 days	3 14	2 75
F ge of days lost	1 10	1 11	1 6
A rage number of s lost per Cat / term	1 79	0 98	0 89

le 3. Results from Questionnaire

	% Yes / More	% No / Less
s the nformation you received about foot care useful?	96 5	3 5
re the leaflets useful?	94 7	5.3
uld you have liked more or less information?	69 3	30 7
you take much notice of the advice given?	86 8	13.2
you use surgical sp nt on your feet?	58 6	41 4
you tape your feet before PLX?	51 7	48.3
you tape your feet dunng PLX?	26 3	73 7
you dry and powder your feel dunng PLX?	54 4	45 6
you use Sorbothane Insoles inside your boots?	50 0	50 0
you use Gertex socks on PLX?	27 2	72 8
you get blisters during PLX?	49 1	50 9
re they mild?	30 7	65 3
derate?	14 8	55 1
ere?	3 5	96 5
you need Sickbay treatment for your blisters?	15 8	84 2

l hypothesis that any variation in the portion of cadets with blisters per term would due to chance alone The Pearson Chi square ue is 15 53 with two degrees of freedom .0 001) Thus the observed differences ween the terms are highly statistically nficant and not due to chance Comparisons of figures for Terms 1 and 2 and Terms 1 and 3 ld Chi squares (with one degree of freedom) of 4 and 9 85 respectively (p<0 01 in both cases) e comparison of Terms 2 and 3 gives a Chi square of 0 05 (p>0 8) In summary the proportion of Cadets treated for blisters was significantly lower in Terms 2 and 3 compared to Term 1 *(Table 2)* Comparison of the proportion of training days lost per term resulted in a Chi-square of 49 9 with 2 degrees of freedom (p<0 001) The average number of days lost per Cadet was markedly lower in Terms 2 and 3 compared to Term 1 *(Table 2)*

The response rate to the Term 3 questionnaire was 97 4% The questions and results are

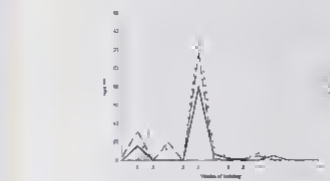


Figure 1 Graph of training days l[ost] d[ue] [to] b[listers] by week

summarised in *Table 3*. Of the 31 cadets who used Gortex socks 12 (38.7%) developed blisters. 29 (49%) of the 59 cadets who taped their feet before PLX developed blisters as did 36 (58%) of the 62 cadets who dried and powdered their feet. Seven (46.7%) of the 15 who claimed to take no notice of the advice developed blisters.

Of the four cadets who developed severe blisters two had followed the advice, used tape, Sorbothane insoles and Gortex socks. One had used tape and Sorbothane insoles and one used only powder.

Discussion

The results of this audit strongly suggest that a multi factorial approach is required in the prevention of blisters and that such an approach can be successful. It is frustrating that few of the recommended interventions have been scientifically evaluated and indeed a thorough review of the literature suggests that some of the common sense advice might be completely wrong[6, 7].

Overall the information given was well received and in part acted upon. The results show that as a whole the various interventions definitely reduced the number of normal training days lost through blisters and it is assumed that the number and/or severity of blisters was also reduced. It is not possible from this audit to determine which individual factors are responsible for the overall improvement. It is of concern that half the Cadets who taped their feet with zinc oxide or used powder subsequently developed blisters on PLX. It may be that the group who used tape were more prone to blisters, possibly having had blisters earlier in the term. It may be that zinc oxide is not the optimum tape use or it may be that taping feet is not useful.

The pathogenesis of blister formation is well recognised and described in detail elsewhere[3, 8]. In summary blisters occur when repeated friction is applied to thick, tethered skin resulting in a split at the level of the stratum spinosum probably due to mechanical fatigue of the prickle cells at this level. The potential space fills with tissue fluid and forms the blister. Factors which affect whether a blister will form include the number of cycles of friction, the thickness of the skin and the coefficient of friction of the skin surface.

The frictional forces (Ff) acting on the skin related to loading and the coefficient of friction of the skin which is in turn related to the state of hydration of the skin: very dry skin has a low coefficient of friction, very wet skin a slightly higher coefficient while moist or wet skin has the highest coefficient. Wet field conditions as in Term 3 would normally be expected to result in greater problems from blisters.

It is possible to postulate optimal blister prevention conditions. Ideally the skin would be thickened and hardened by conditioning or tanning. It would be maintained in a dry state at the interfaces between foot and sock and sock and boot would minimise transmission of friction from the boot to the skin. Free movement of the foot inside the boot would be minimised and loading and locomotion speeds reduced to a minimum. The last two factors are not, however, medical considerations.

Various methods of maintaining dry skin have been investigated including the use of foot powders and antiperspirants[4, 5]. Talcum powder initially reduces the Ff on skin but after a short time as sweat is absorbed by the powder the values rise well beyond normal. There are studies which show that the use of talcum powder inhibits blister production. Antiperspirants have been shown to reduce the amount of sweat produced by the feet but not to reduce blister formation. No work appears to have been done on preventing ingress of extraneous water and the value of MVP materials which allow wicking of sweat but prevent ingress of water has not been assessed.

Various skin lubricants such as petroleum gel, mineral oil, propylene glycol, peanut oil, glycerine, silicone and even sebum have been tested but after an initial fall in Ff there is a subsequent rise thought to be due to increased skin hydration[6].

Various sock types and combinations have been ed to determine which is best at removing m isture from the skin surface and reducing the n smission of Ff The use of two socks has been wn to offer an advantage over one and the comm system appears to be a thin synthetic k next to the skin with a thicker wool sock side to absorb sweat and affiud cushioning[5 2] P yester socks have been shown to offer an ad antage over natnlal fibres

losed cell neoprene insoles have been shown to ramatically reduce the incidence of blisters in sp rtsmen although some of these trials had s ons design faults [1 8 20] Sorbothane has an n n cell structure The use of lubricating sprays the skin such as Teflon (PTFE) has been ocated on theoretical grounds bnt not fully estigated[3] The nse of lubricants on the inside faces of the hoot does not seem to have been died

Attempts have been made to harden or tan the n and glutaraldehyde has been used to good ct[4 17] Anecdotal evidence exists as to the value surgical spirits in tanning the skin and the ctice has been popular for many years

A variety of skin dressings are advocated by rts coaches and walkers of which Moleskin is a nilar example[15] There is no published data on use of zinc oxide tape although the use of poly yl chloride tape has been fonnd to be bnneficinl preventing blisters[1] Zinc oxide tape is very ap very adherent and it is robust enough to ve on the feet for many days even during nons military training It does not however ve a slick outer surface and the tape can absorb ne water These factors may increase the Ff unst the skin in certain circumstances The use some form of tape seems sensible bnt it is far m clear that zinc oxide is the optimum material ork is needed to assess the coefficient of friction tween zinc oxide and various sock types

It is recognised that military boot development a highly specialised held and that continnous provements are being made There is some idence thnt blister incidence is not related to w well fitted are an individual s boots[11] It has en shown that skin adaptation and conditioning es place in response to repeated low intensity ction and that the more time spent wearing oots and the more running done, the less lihood of subsequently developing blisters[5 7] would be very beneficial to issue military boots Cadets prior to them joining BRNC to allow the oots to be broken in and the skin to be nditioned This would be an extremely economical method of preventing blisters during initial training.

Conclusions

Despite advances in technology military training and operations continue to be dogged by apparently innocuous friction blisters A multifactorial approach can reduce the number of days of normal training lost due to blisters but it is not clear which elements are responsible for this improvement Published data suggests that instead of advocating the use of talcum powder and natural fibre socks the use of synthetic materials and a two-sock system should be promoted There is good evidence that keeping the feet dry is sound advice and MVF materials might have a significant role Consideration should be given to improving military insoles and to issuing boots in advance of the commencement of military training The optimum combination of preventive measures remains elusive Further research is required into methods to reduce Ff and areas of interest include the foot/tape/sock interfaces the sock/boot interface the application of modern lubricants to the inside of the boot and the use of modern MVF materials BRNC would be an ideal establishment in which to conduct the necessary trials

Acknowledgements

The nudors would like to thank the Sick Bay staff at BRNC for their assistance and Dr R Feiby bridge of the Institute of Naval Medicine, Alverstoke for statistical advice

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An audit of cholesterol measurement in patients with ischaemic heart disease in a District Hospital

M Turner, S Hutchings, A J Marshall

Introduction

Reduction of serum cholesterol levels with HMG Co A reductase inhibitors (statins) in combination with diet improves outcome in patients with established ischemic heart disease (secondary prevention) and in high risk males[2] (primary prevention) Patients with IHD and an average cholesterol level (mitial serum cholesterol <6 2 mmol/1) also have a lower incidence of death from coronary heart disease non fatal myocardial infarction and total mortality when treated with pravastatin [3] Statins may have an effect on endothelial function that is not related to merely lowering cholesterol [4] We decided to audit the measurement and subsequent treatment of cholesterol levels in patients presenting with unstable angina or myocardial infarction (Group 1) and in those undergoing coronary angiography for ischemic heart disease (Group 2)

Method

Both groups comprised consecutive eligible patients admitted to Derriford Hospital Plymouth after 1 April 1995 Patients in group 1 were identified by the hospital audit department from computerised records Patients in group 2 we identified from the angiography register in t catheter laboratory Hospital notes were obtain and examined

Patients were said to have had the ser cholesterol measured if it was done during before the index admission Both medical no and laboratory reports were examined evidence of cholesterol measurement Dieta advice was said to have been offered if there w either a comment in the medical notes that it h been requested or if a dietitian had written t advice had been given It is possible that so patients receive dietary advice from coronary c nursing staff without a record being made in t clinical notes however we believe that diet is sufficient importance in these patients to warra form d referral to a dietitian Cholesterol lowerin drugs were said to have been prescribed if such drug appeared either on the patient dischar sheet in the discharge summary or in t subsequent clinic visit notes or letter

Results

The results of the audit are shown in the table

Table 1 Number of cholesterols measured

	Measured	Not measured	Total
Coronary angiography	33	8	41
Unstable angina/MI >70	14	29	4
Unstable angina/MI <70	36	24	60

Table 2 Serum Cholesterol levels mmol/l

	Mean	Range
Unstable angina/MI age >70	7 1	4 5 – 10 6
Unstable angina/MI age <70	6.2	3.3 – 8 5
Coronary angiography	6 3	4 5 – 8.5

Table 3. Treatment advised

	Dietary	Drug
Unstable angina/MI age >70	0	1
Unstable angina/MI age <70	9	1
Coronary angiography	1	0

patients undergoing coronary angiography usually had the cholesterol measured but treatment was not often given during the study period Patients presenting with acute ischaemia were less likely to have the cholesterol measured if they were over the age of 70 years Even in younger patients only two out of three patients had their cholesterol measured

Discussion

It is clear that at least during the study period serum cholesterol was not even measured in some patients for whom cholesterol-lowering strategies would have been of benefit There were also many patients in whom elevated serum cholesterol was identified but neither dietary nor drug treatment was offered

These findings are not unique A British Cardiac Society survey of 12 district hospitals and 12 specialist cardiac centres found that serum cholesterol was the least well documented risk factor in a population of patients with an established diagnosis of ischemic heart disease [5] Approximately half of the patients had undergone revascularisation Sixty four percent of males and 59% of females had serum cholesterol measurement recorded in their notes In another way over one third had no record of their serum cholesterol despite definite evidence of coronary artery disease Over three-quarters of the patients in this survey in whom cholesterol was measured had a level > 5 2 mmol/l Therefore more than a quarter of patients may be denied a treatment capable of offering significant survival benefit

The Scandinavian Simvastatin Survival Study (4S)[1] enrolled patients between the ages of 35 and 70 and followed them for five years The CARE study included patients who were approaching 80 years old by the end of the study The Heart Protection Study which has yet to report should provide definitive data on the more elderly population Patients over 70 years have a higher mortality following MI than younger patients so there may be even more to gain Our data suggests that there is an agest approach to cholesterol measurement in our hospital

All patients presenting with cardiac chest pain or undergoing coronary angiography for ischaemic heart disease should have blood taken for serum cholesterol on admission if not already known Patients with coronary artery disease and serum cholesterol > 5mmol/l should be treated with an HMG Co A reductase inhibitor (statin) in addition to a low cholesterol diet The cholesterol level should then be monitored If the target level of 5 2mmol/l is not achieved then either the dose of the statin should be increased or a more potent agent should be used Some patients with a serum cholesterol concentration less than 5 5mmol/l may also be eligible for therapy Liver function tests and creatinine kinase should be monitored in accordance with the manufacturers guidelines

We intend to re audit the implementation of these guidelines in our hospital to ensure that the evidence turns into medicine

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ABSTRACT

Dalgleish JR. **The Effects of Paint Solvent Exposure on Submarmers. PhD Thesis, Newcastle 1995**

The study was undertaken to investigate the exposure of submariners to paint solvent vapour during internal painting of the submarine with a view to demonstrating that occupational hygiene principles were being successfully implemented to control chemical hazards onboard a submarine. The study traced the progress of investigation from a limited understanding of the problem through material toxicity assessment and possible replacement by less toxic substitutes, to operating written systems of work for application of paint and where necessary supplementing engineering controls by employing personal protective equipment. The exposure of personnel employed on painting duties throughout a range of areas were assessed using approved HSE MDHS methods using charcoal absorbent tubes solvent desorpti and gas chromatography. Only 10% of the locati monitored exceeded the Synergistic Hazard Ind (SHI) and only 2.5% of these areas exceeded SHI of 2. To augment this and assess perspective of painters to the effects of mha solvents a questionnaire (designed to assess S Building Syndrome) was issued to all painters a a control group of submariners employed asho Whilst recognising the limitations of a non speci questionnaire the results suggest that even limit solvent exposure would appear to signify a rais incidence of medical symptoms. Biomass assessing the excretion of mein methylhippuric in urine of a limited number personnel w undertaken. Preliminary results lead to conclusion that there is a relationship as unformulated between the level of exposure a rate of excretion of solvent metabolites in urin

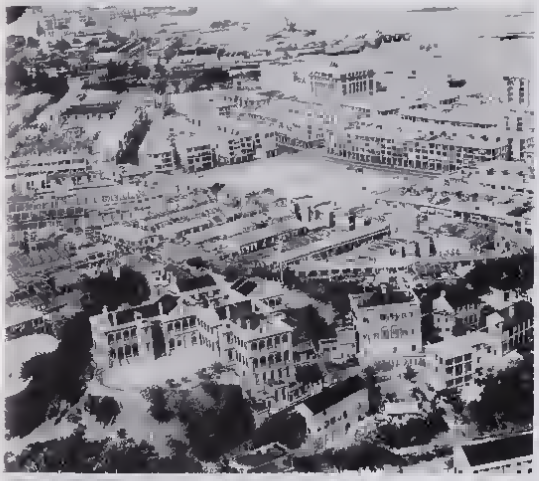
(See Service News)

History

Royal Naval Medical Service leaves Hong Kong

rtly before Great Britain handed sovereignty fong Kong back to China the British military ical services latterly led by Surgeon mmander Noel Bevan Royal Navy left the ny thus ending a long and proud history of fine ice

Harry Mitchell until recently Secretary of the RN Medical Branch Ratings and Sick Berth Staff Association served on board HMHS *Oxfordshire* during these historic days He shares some recollections in the paper which follows



D [illegible] aph of the Royal Naval Hospital [illegible] Kowloon HMS A[illegible] in the background d[illegible] happy memories for some readers It also serves as a reminder of the courage and dedication of medical and sting staff who served in the colony during World War II especially during the invasion of December 1941 and upation by the Japanese until August 1945 The medical staff included three QARNNS officers who were l in the Civilian Internment Camp from summer 1942 until 31 August 1945 when they were freed and taken oard HMHS *Oxfordshire*

HMHS *Oxfordshire* and the Re-occupation of Hong Kong 1945

H A Mitchell

SS *Oxfordshire* an 8646 ton liner built in Belfast in 1912 by Harland and Woolf for Bibby Brothers and Co to ply on the passenger route between Liverpool or Tilbury and Rangoon first served as a hospital ship for the Army in World War I In 1939 she was requisitioned by the Admiralty and after conversion to HMHS *Oxfordshire* served at Freetown West Africa as the Base Hospital and then off North Africa, Salerno Sicily and Anzio before, following a brief spell in Indian waters becoming an integral part of the British Pacific Fleet, sometimes on loan to the US Seventh Fleet She was among the first Allied ships to enter Hong Kong after the capitulation of Japan in 1945 Her final role was the repatriation of British POWs who had been in Japanese hands bringing them home to the United Kingdom for Christmas Records show that during World War II HMHS *Oxfordshire* received 22 331 patients and steamed 147 650 miles



Staff [illegible] aboard [illegible] HMHS *Oxfordshire*

Accommodation

In her peacetime role SS *Oxfordshire* was a first class ship in every way affording her 247 passengers luxurious travel in light, airy cabins and public rooms on A (Boat) B (Promenade and Poop) and C Decks Two lower decks provided accommodation for other crew engine and machinery rooms fuel stores and baggage holds Some of the crew were housed aft on B Deck and others forward on C Deck During conversion in 1939 additional accommodation was constructed and the public rooms were stripped out to provide wards with single cots on gimbals and below decks other areas and holds were converted to accommodate patients in 2 tier cots on gimbals

A (Boat) Deck

Additional accommodation was fitted above the Boat Deck to house an area for treatment of Zymotics and Contagious Diseases A Mortuary over a Laundry and Autoclave Room were constructed above the crew quarters on B Deck

Right forward on the Boat Deck was the Office Ward with cots for about 24 patients then Operating Theatre athwartships a row of cab for nursing officers on the port side and medical officers on the starboard side with second Operating Theatre making the fourth of the rectangle A small bridge led to the Zymo and Contagious Disease wards each with 10 be A ladder led down to the Promenade Deck

B (Promenade) Deck

Forward on B deck was the mahogany panell Officers Dining Room which also served as th sitting room in the evenings and provided venue for the all ship church service on Sunda In the waists amidships were cabins for Chaplain and officers including the Matron T waist area was also used as a cinema when fil were available from shore establishments swopped with other ships Overlooking the W Deck aft on C Deck were cabins for the Chief Pe Officer and Regulating Petty Officer

C Deck

Ladders led down to the Aft Well Deck where t dinty Sick berth ratings would gather for tomb and an occasional impromptu concert A sm

Harry Mitchell is a retired member of the Royal Naval Sick Berth staff and now lives in Southsea



HMS *Oxfordshire* enters Sydney Harbour Christmas 1944

rway led towards the stern and the Barber's
p and a Rest and Recreation Room which had
to offer apart from a tatty darts board and a
n with many keys missing! Passing forward
n the Well Deck through n double door one
red n corridor with on the port side the
ministration Office X Ray ENT consulting
m and Dental Surgery and on starboard the
ratory Dispensary and mnle heads and
hrooms The corridor opened into the 45 bed
ical C2 Ward which had n lift forward to
ver patients to and from the Operating
atres on the Boat Deck and a stairway to the B
k Dining Room Immediately forward was C1
rd used principally for Medical and Urinary
es and again with 45 cots A galley adjacent to
C2 served both wards

D and E Decks

Deck was entered through hatches in the
ward and Aft Well Decks It housed Wards D1
and D3 each with 40 single cots on gimbals A
patient Mental Department was provided in t
ner of D3 separated by a wire cage from the
mainder of the ward The two wards on E Deck
ommodated upto 90 patients each in 2 tier cots
imbals These wards were used principally by
walking patients and in mn occasion by the staff
of a Military Hospital in transit Each ward had a
small galley to which food would be brought from
the Main Galley and kept hot until it was served
often by patients nominated as messmen to draw
and issue food under the supervision of the Sick
Berth staff Workshops for the Chippy and
Sailmaker were forward of D1 Ward The SBAs
had their Mess far aft on E Deck

Staff

The hospital functions of the ship were under
command of a Surgeon Captain There were 10
other Medical Officers nine Nursing Sisters n
Roman Catholic and a Church of England
Chaplain and 60 70 Sick Berth staff Charge of
each ward was shared between a duty Nursing
Sister for nursing and a PO or LSBA for other
matters

Arrival in Hong Kong

On 27 August 1945 HMHS *Oxfordshire* was n
Subic Bay Leyte when the order came to
discharge her patients to n US hospital ship and
proceed to join Task Force 57 of the British Pacific
Fleet off Hong Kong We sighted the coast of
China at 1000 on 30 August and an hour later



HMHS *Oxfordshire* (ex-*Empress of Russia*, Hong Kong Harbour, 30 August 1945)

spotted the aircraft carrier *Venerable* and *Indomitable* with their destroyer escorts. Planes could be seen taking off and circling above Hong Kong, about 76 Stuffers and Avengers in all over us and we gave them a loud cheer. As it were uncertain what the Japanese might do at the last moment we were at Battle Stations in Operation Gemini (as it was instead of Victual).

We steamed along at 14 knots and sighted the battleship *Austin* and her attendant destroyers (by at 1245 and have no direct or Asdic contact we could see what appeared to hundreds of Mirages in full battledress lining the decks. Our waiting was punctuated by excitement in what proved to be a false alarm about a possible attack by suicide planes. At 1415 under carrier planes from the two carriers we began arriving slowly but steadily at 2 to 5 knots following Avenger and four destroyers in line astern, a tanker and two escorting submarines following us. Suddenly a launch shot out of the harbour and a destroyer seemed to move to intervene but it proceeded only to be the pilot boat. This took up position at the head of the line and led us all along a channel which had been marked with white buoys overnight by the minesweepers.

At 1600 while we were sailing the main islands which lie in the entrance to Hong Kong Harbour the submarines *Syrtis* and *Sea Scout* took up position ahead of us and then we caught our first glimpse of Hong Kong, but were not allowed to enter. The ship anchored overnight in Junk Bay in small relief just outside the inner harbour. Lit up like a Christmas tree we stood by to replenish with water hoses. Many Chinese sampans who, not discouraged by the 200 yard exclusion zone circled us until after dusk seeking whatever custom and some food.

The ship entered the inner harbour at 0930 on the following day 31 August, and headed for Kowloon where she was to become the first Allied ship to come alongside for three years and eight months. The masts of sunken ships stuck out of the water like the branches of trees in a field. From all over the harbour side could be heard the sound of saw mills, as the Marines chiseled hooters. Hordes of sampans crowded round the ship, the chatter of the occupants producing a sound like a flock of birds.

Once alongside we could see Japanese troops marching, along fully armed and under command of officers wearing swords, apparently ignorant



IS *Oxfordshire* [illegible] (This [illegible] is published by permission of the Illustrated London News Picture [illegible]).

Marine patrols. At that time the Japanese [illegible] exceeded in number those of the Allies who [illegible] ashore and they did not have the demeanour [illegible] he conquered, perhaps because defeat had [illegible] by A bomb rather than in battle.

POW Hospital

PO Ken Clarke in his capacity as Official [illegible] ographer was taken by the Medical Officer in [illegible] rge, Surgeon Captain Hugh Willoughby [illegible] mpanied by the Matron and Padre to the [illegible] W Camp and Hospital in a requisitioned [illegible] man car which had been used by the Japanese [illegible] their way to the hospital which before the war [illegible] been the Royal British School the roads were [illegible] wded with squads of Japanese soldiers on their [illegible] to surrender their weapons, patrols of British [illegible] nes, wealthy Chinese in fast [illegible] cruises [illegible] h laden handcarts piled high with looted goods [illegible] children and grumpy old released POWs [illegible] ing their own way to the docks.

At the Hospital the party was greeted by the Senior Medical Officer and several prisoners and invited to see the wards where they were treated like Royal visitors by tragically thin men with tears in their eyes all wishing to shake them by the hand - even the bed patients raised themselves to wave. The prisoners bombarded their visitors with questions about the war and back home rationing, Buzz Bombs and the V2 rockets. It appeared that the Japanese had kept them quite well informed about the Allied German war but had distorted news about the war in the Pacific.

The Hospital was remarkably clean and the grounds and lawns neat and tidy. It was under the command of the Camp Commandant Dr Sito but the services and care were provided by British staff. Many of the patients had been wounded in the battle for Hong Kong but there were also severe cases of tropical diseases such as malaria and beriberi. There had been severe outbreaks of diphtheria and dysentery. Hundreds were said to have died before Dr Sito allowed antitoxins and other drugs to be brought into the hospital from



Medical Officers, Civilian Internees and RMHS *Oxfordshire* at Lei Ho Tang Hong Kong 1945

captured RAMC stores. Surgically very little was available in the stores but was released. The visitors were told that many loads of stores had arrived a day or so earlier – shortly after the Emperor made his capitulation speech. It appeared that at the same time Dr Sito ordered the destruction of the medical records perhaps lest these would incriminate him.

Rations had been about a pound of rice a day a small tea allowance and some vegetables. Extra food could be smuggled in by the Formosan guards but the POW pay could buy little. There was a weekly issue of cigarettes containing a foul black tobacco known as 'Cow Dung'. During the whole of their captivity these POWs received only 8 Red Cross parcels from Canada. It was thought that thousands of these parcels had been sold by their captors. Little was said about atrocities. As the party left the hospital a ramshackle ambulance which had been resurrected having spent the Occupation in a shed was leaving fully loaded with patients.

By 2100 that evening most of the Service personnel had been embarked in *Oxfordshire* and served a hot meal. All were appreciative of a decent bed yet it seemed scarcely to be like a dr lifting their spirits to great heights and few like sleeping that night. They asked the Sick be staff questions after question but all were reluct indeed refused to answer questions about POW Camp and Hospital.

QARNNS officers freed from internment

There were three QARNNS in the medical lin the Civilian Internment Camp and they toge with other staff were evacuated to HM Oxfordshire the next day. Apparently they had equivalent rank in the Japanese Navy and so been denied any pay on hearing of this officers had smuggled a monthly allowance them. One of the three was Miss Olga Frank later to be Matron in Chief QARNNS. *(Rebo her time in the Internment Camp, includ shoppers and wooden buttons, form part of QARNNS collection at the Institute of Na Medicine. Editor.)*

Civilian internees

That evening the worst part of it all took place Australian minesweeper brought to *Oxfordshi*

l of released civilian internees All were in a state of health some without possessions and rs with nothing of their pre War life in Hong g but a dirty bundle of clothes There were old young women all terribly emaciated some spindly legs which could hardly support n Men of all ages with faces worn by the rs they had seen eyes dull with despair ie walked but others had to be helped or carried ard on stretchers Despite their terrible ation all thanked and praised the staff in true ish fashion They could now appreciate that r living Hell was over but knew not what lay ad and what life had to offer Sadly some died re Australia was reached but one baby was n during that voyage

casualties

had only two casualties to treat during our stay first was a British officer who caught his pack his Sten gun and shot himself The second was ting who failed to answer a challenge and in the was shot by his own patrol! A bullet was ged in his spine and remained there until we ved in Australia.

Final days

The Final Surrender was signed in Tokyo on 2 September but negotiations seemed to continue in Hong Kong as more and boatloads of Japanese troops poured into Kowloon from Hong Kong seemingly still reluctant to accept defeat They were filed into a warehouse guarded by Marines surrendered their weapons to a British officer and were marched off to occupy the prison camp we had just emptied About 2000 that evening there was a sudden outbreak of heavy gunfire which persisted for about 2 hours as a battle raged between looting bandits and Allied patrols The battleships in the harbour turned on their searchlights to make night like day and there was much scurrying to and fro before all our troops were withdrawn from the most troublesome building which the destroyers then raked with Oerlikon fire until it was reduced to a shell There was no more trouble from within!

Finally sailing orders were received and we cast off at 1430 on 3 September Admiral Harcourt escorted by Tommy gun bearing bodyguards stood on the quay waving farewell We sailed via Manila arriving at Brisbane on 28 September and Sydney in early October

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Fortune favours the Brave - The Capture of Guadeloupe 1815

R A L Agnew

Summary
In August 1815 Sir Philip Durham and Sir James Leith with the help of the French Royalist Comte de Vaugirard from Martinique landed a body of troops on the island of Guadeloupe. After a skirmish in which the British army lost 16 killed and about 50 wounded the Comte Linois struck his flag and surrendered the island. Afterwards he was along with his adjutant general conveyed to France under the terms of the articles of the capitulation treaty. The Commander in Chief of the Leeward Islands Squadron at that time Admiral Sir Philip Durham KCB and his Secretary Surgeon John Forbes played important roles in the recapture of the island.

Introduction
Under the terms of The Treaty of Paris signed on 30th May 1814 following the defeat of the French Empire and the armies of Napoleon at Leipzig in 1813 all the captured colonies in the West Indies except Tobago and St Lucia were restored to France *(Figure 1)*. The defeated Emperor Napoleon was banished to the island of Elba. In France the restoration of the Bourbon monarchy was not generally accepted and the Bonapartists were encouraged to plot the return of their hero to the mainland. Napoleon's brief return to power in 1815 his Hundred Days had effects in several of the French Empire's overseas possessions including the two principal islands of the French in the Caribbean Martinique and Guadeloupe which had been taken by the British in 1809 and 1810 respectively then returned to France in 1814.

The Governor of Martinique the Comte de Vaugirard was loyal to King Louis XVIII. At the Comte's invitation British troops under the command of Sir James Leith Governor of Barbados made an unopposed landing at Martinique on 5th June to prevent any Bonapartist uprising against the Royalists. In contrast in Guadeloupe with the full support of the Governor Vice Admiral the Comte Linois the Bonapartists raised the tricolour on the 18th of June, the day of

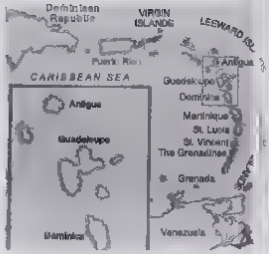


Figure 1 Map of Caribbean showing the island Guadeloupe's relation to the rest of the islands

Waterloo. Within two months however the island had surrendered to a combined British army naval force.[1] The naval Commander in Chief of Leeward Islands Squadron at that time Admiral Sir Philip Durham KCB and his Secretary Surgeon John Forbes played important roles in the recapture of the island.

Sir Philip Charles Henderson Calderwood Durham
Durham's life and naval career have been fully described in the Dictionary of National Biography. He was in command of HMS *Defiance* 74 guns off Cape Trafalgar in October 1805 where he was in the thick of the action. Collingwood's column against Villeneuve. Although outgunned he captured the French line of battle ship *L'Aigle* in a fierce engagement[2]. He was appointed Rear Admiral of the Blue in 1810 and of the White in 1812[3]. In December 1814 flying his flag in HMS *Venerable* he was sent as Commander in-Chief of the Leeward Islands station. His main task in 1814 was to clear the Caribbean of American privateers until peace was made in December with the United States. A little

Dr Agnew is a Consultant Emeritus Chest Physician in Liverpool.



A [illegible] KH [illegible]

trait (artist unknown) shows Durham wearing Grand Cross breast star of the Order of the th, a small gold Trafalgar medal and the breast of the Knight Grand Cross of the French Order Military Merit, awarded to him after the defeat Napoleon in 1815 *(Figure 2)*

Surgeon John Forbes *(Figure 3)*

n Forbes was born at Cnitlehrne near Cullen Banffshire in December 1787 the fourth son of oral tenant farmer He received a good early ication at the parish school in nearby Fordyce n a scholarship to Aberdeen Grammar School subsequently entered the Arts Class at Marischal College of the University of Aberdeen 1803 After two years he moved on to inbnreh where he gained the Diploma of the llege of Snrgeons in February 1806 The lowing year aged 20 years he entered the dical service of the Royal Navy as a Temporary sistant Surgeon sailing from Leith in Fishing ack to London and thence travelling by coach to n HMS *Royal George* at Plymouth

Having been confirmed Full Snrgeon on 27 uary 1809 he left *Royal George* a week later tween then and 25 April 1814 when he joined MS *Venerable* on the Leeward Islands Station as miral Durham's Flag Surgeon and Secretary[7]

served in various ships and shore ablishments including Haslar Hospital when he was Assistant Medical Officer from 6 January to 7 April 1811 Having learned basic French at school in Scotland he improved his knowledge of that language German and Italian during his spare time at sea[8] He was a strong swimmer and saved the life of a shipmate in the Carnhem and later of a rating washed overboard into the river Elbe On the latter occasion Forbes dived in and nearly lost his own life as he was swept for two miles down river in the strong current before being rescued[8]

Guadeloupe, 8th-11th August 1815

The expedition against Guadeloupe was mainly an assault by the Army the role of the Navy being confined to acting as troop carriers and in support bombardment of the shore defences The part played by *Venerable* as flagship is covered in detail in her Commanding Officer s (John Thomson) Captain s Log[6]

His Excellency Sir James Leith (1763 1816) Governor of Barbados was Commander in Chief of the Army during the expedition [6] He came from an old Scottish family and had attended Marischal College of the University of Aberdeen before entering the British Army where he had a distinguished career particularly under the Duke of Wellington in the Peninsular War This had been rewarded with a knighthood just before his appointment to the prestigious post of Governorship of the Leeward Islands in 1814



A [illegible] 1869 [illegible] s photo

Sadly like so many others he died of yellow fever in the year after his victory at Guadeloupe

Two letters handwritten by Forbes as Durham's secretary describe the build up to the landings. The first is dated 24 July 1815 and was received by the Admiralty on 12 September[1]. In this the Admiral having observed the tremendous surf on the island of Guadeloupe and which continued for several days with heavy rains.. expressed his concern to the Army Commander of the dangers for the attack of an Island at this period of the Year However Durham goes on to say that he found that the French governor of Martinique had already assembled a considerable force consisting of all the white troops as well as Flat Bottomed and Mortar Boats.. built at his own expense Moreover the Comte de Vaugirard had pressed his argument for an early assault on Guadeloupe by pointing out the strong possibility of the arrival there of reinforcements from France. Durham concluded his account to the Admiralty of the Council of War held on board *Venerable* Finding His Excellency is resolved to proceed as soon as possible I have offered him the very disposable Force which will consist of the VENERABLE and four sloops

The second letter dated 2 August 1815 is also from *Venerable* stationed at the Iles des Saintes off Basse Terre on the most southern tip of Guadeloupe[1] This informed Their Lordships that Durham had sailed from Carlisle Bay at Bridgetown Barbados having on board His Excellency Sir James Leith Major General Sir Charles Shipley the Heads of Departments and part of the 15th Regiment [East Riding of Yorkshire] *(See Note 1)* in company with the Ships of War Transports Hired and Bomb Vessels *(See Note 2)* with about Three Thousand Men for this Anchorage the General Rendezvous where we shall remain till joined by some detachments from the neighbouring Islands and then proceed against the Island of Guadeloupe Durham again expressed his fears for the expedition not only on account of the lack of landing craft there not being a single Flat Bottomed Boat on the Country but also because of the impending onset of the Hurricane Season in the Caribbean He also seems to have lacked confidence in his new French allies I now find myself surrounded by Strangers in whom I can place no confidence

In spite of these forebodings of possible disaster the attack went ahead on 8th August and is fully described in Durham's despatch to the Admiralty from *Venerable* dated 15 August 1815 [1] To quote

The last division of the Troops having arrived on the 7th instant the Island having been reconnoitred by the Commander in Chief of the Forces and myself aided by the distinguished and indefatigable Engineer Charles Shipley the Place of debarkation having been determined upon all Overtures to the Enemy having been rejected with Scorn and the Rainy and Hurricane Season having set in, not a moment was to be lost Accordingly 53 Sail of Transport, with 5000 men in company with the Vessels of War and Troop Ships DASHER, FAIRY ESPIEGLE, COLUMBIA BAREADOES MUROS CHANTICLEER FOX(H) NIOBE (TS) Artillery and the usual appendages to the Army proceeded to the weathermost landing place Sainte Sauveur had been proposed to have landed in three divisions at the same time but the want of Boats put that out of our power) where from the admirable position taken up by Lieutenant George Tupman Acting Captain of the CHANTICLEER who swept the beach of a few Troops being covered by the FAIRY and ESPIEGLE the debarkation was soon effected We then dropt down to the next landing place Grand Anse where we found a large body of Troops and a Battery commanded by Comte de Linois and General Boyer I ordered Captain Baker of the FAIRY Captain Chads of the COLUMBIA and Captain Fleming of the BARBADOES to cover the landing of the Troops and from the well directed fire the Battery was soon silenced and the enemy drove back in a respectable distance. 2000 men were then landed without the loss of a Man As it was by now getting late in the day and the Boats not having returned in the dark the third landing was postponed until the following morning This was accomplished with equal success on the leeward part of the Island near Baillif under cover of the CHANTICLEER FOX and MUROS in the face of a very large Force who retreated to the Heights and the capitulated on the Morning of the 10th inst.

Durham enclosed a copy of the Terms for the Lordships' information and mentioned that he had taken possession of a few ships and the floating Property that remains The news of the capture of Guadeloupe reached J W Croker Esq. Secretary the Admiralty on 12th September and must have caused much pleasure especially as so much

l cost of fitting out the expedition seems to have
b n borne by the Comte de Vaugraud'
s final letter [4] dated 16th August 1815 refers to
u Prisoners of War I shall in a few days send
n under convoy of the FOX to Havre calling at
S Helen s for their Lordships orders in case the
[ke [of Wellington] should be in England The
l ar is signed by Rear Admiral P C Durham,
(ommander in Chief
tis clear from Durham s Dispatches that he got
well with Sir James The fact that Durham s
retary John Forbes was also n Scot and fellow
e duate of Marischal College Aberdeen no
ubt played a part in establishing this
monious inter service relationship antipathy
ween Admirals and Generals was formerly not
uncommon feature of combined operations [5]
From this brief account it may be seen that the
adeloupe venture was quite a close run thing in
w of the unpredictable weather and the dangers
n amphibious operation Neither Durham nor
th had been present at the previous landing in
afeloupe in 1810 and Durham also seems
ially to have been lacking confidence in his
ss. Good liaison was essential and one
portant factor in this respect was Durham s
lity to speak French he had spent two years in
nce before the Wars learning the language
mixing freely in society [6] Communications
h the French would also have been helped by
n Forbes knowledge of their language[6] It is
l that shortly after the surrender of Guadeloupe
rham had used this talent by sending Forbes
r to help the surgeons of n stricken French Ship
ich had surrendered after a heavy cannonade
ere were many casualties amongst the crew and
bes was ordered by Durham to help the French
geons as he was the only surgeon in the
adron who could speak French [7]

bsequent careers of Durham and Forbes

rham became an Admiral of the Red on 4 June
14 was promoted to Vice Admiral on 12 August
19 and to Admiral on 22 July 1830 On 17
vember 1830 he was created GCB he became
MP for Devizes from 1834 to 1836 He flew his
e as Commander in Chief Portsmouth from
rch 1836 until his retirement from the Navy in
ril 1839 He died at Naples in April 1845[8]
With the rest of the ship s company John Forbes
s finally paid off from *Venerable* on the 30th May
en the ship arrived back in Portsmouth[9] This
s his last appointment in the Royal Navy He
duated MD at Edinburgh in 1817 dedicating his
sis to Philip Charles Durham and went on to
achieve fame in the medical world by translating into English in 1821[10] the French physician René Laënnec s classical book on Diseases of the Chest, De l Auscultation Médiate' whilst a Physician in Penzance, Cornwall (1817 1822) He later practised in Chichester Sussex from 1822 to 1840 before moving to London where he combined the careers of being a successful medical journalist with his duties as Consulting Physician to the Brompton Hospital for Diseases of the Chest He was appointed as Physician to the Court of Queen Victoria in 1841 who knighted him for his services in 1853[11] A fuller account of Forbes life has been given elsewhere[12]

Forbes abhorred polypharmacy and was a great believer in the Vis Medicatrix Naturae[13] His final work Of Nature and Art in the Cure of Disease [14] was published in 1857 and is n philosophical little book on this theme Sir John Forbes MD FRCP FRS DCL died in 1861 at the home of his only son Alexander Clark Forbes at Whitehurch on Thames just before his seventy fourth birthday

Acknowledgements

I am grateful to Graham Salt Research Historian for his help with some of the naval references Figure 1 is reproduced by courtesy of Ewan Macnaughton Associates Syndication Agents for the Telegraph plc Figure 2 by courtesy of Phillips of Scotland Auctioneers and Figure 3 by kind permission of the Journal of the Irish Colleges of Physicians and Surgeons

Note 1 The 15th Foot, Yorkshire East Riding, became the East Yorkshire Regiment in 1881 and was so named until its amalgamation with the West Yorkshire Regiment in 1958 to form the Prince of Wales's Own Regiment of Yorkshire The Regiment was awarded the battle of honour of GUADELOUPE in recognition of its contribution to the taking of the island from the French in 1810

Note 2 A Bomb Vessel or Bomb The main weapon of the Bomb was a mortar which fired an explosive shell of high trajectory for shore bombardment

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C[illegible]
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[illegible]5 795
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E ook Reviews

F rence **Nightingale: Letters from the Crimea** 1 4–1856 Ed Sne M Goldie Mandolin I anchester University Press] Jnnc 1997 Pp 326 £ 00

I rence Nightingale was an avid letter writer f ting more than 300 letters during her time in tl Crimea and this paperback book contains 100 them From rapid notes to her family to aprehensively detailed reports to the War t ice, this collection chronicles her own battles l ng that wartime period

situations relating to the letters have been well earched from military religious and personal tives and the book includes a nup tographs and some illustrations Copious s at the end of each chapter a comprehensive h tiography and index assist the reader in owing the narrative of each situation which ld otherwise be disjointed by the chronological uence of the letters

The breadth of subject matter necessitating s Nightingale s attention is awesome as is the le of numbers involved in a Victorian overseas r Of particular interest to present day service dical nursing and administrative personnel ll be the lack of basic management of a large pital and some indication of the treatment and e (or lack of it) given to the patients As in so ny previous conflicts disease starvation and k of transportation for the sick and injured led to the horrendous mortality rates

Florence Nightingale eventually set in train efficient management of all aspects of the pital function the cleaning and equipping of hospital the reception treatment care and abilitation of patients the training of surgeons nurses the ratio of staff to patients the vision of stores food and special diets and the istics so vital in understanding any situation presenting findings for official reports

The battles with red tape officious senior ers religious factions and malicious inctions were not helped by ambiguous orders ieming Miss Nightingale s position and hority and by her sometimes tactless and ogant management style doubtless caused by er frustration at the rigid interpretation of orders and the delays which caused so many deaths amongst the ordinary soldiers

Anyone interested in the military history of patient care or hospital administration will find this book fascinating in itself but it is also fundamental to the understanding of how military and civilian hospital administration and patient care has developed over the last 150 years

Claire M Taylor
Captain QARNNS (Retd)

Non-random Reflections on Health Services Research Eds Alan Maynard and Iain Chalmers BMJ Publishing Group March 1997 Pp320 UK £22 95 Overseas £25 00

When Archie Cochrane gave a lecture in Edinburgh in 1972 based on his Rock Carling monograph entitled Effectiveness and efficiency random reflections on health services his views provoked considerable public interest and professional debate His central theme was that there was not an inadequate knowledge base for much of the care provided and he argued for the evaluation of new and existing forms of care in controlled trials Over the past 25 years his ideas have had a fundamental and enduring impact on medical practice both in the UK and abroad

Non random Reflections on Health Services Research has been compiled to celebrate the 25th anniversary of the publication of the Rock Carling monograph The book is in six parts The first starts with a collection of personal reminiscences from those who knew Archie Cochrane and his work well Richard Doll Kerr White and Dick Cohen Gordon MacLachlan tells how the monograph came to be published and Andre Kongnonni Etienne Guberan and Hugh Thom is describe how his central theme has been developed on the Continent and America as well as in the UK

The remaining five sections of the book are collections of papers grouped under the headings of epidemiology effectiveness efficiency equity and evolution All the contributions are authoritative but they are far from being dull The ideas are presented clearly in an open and

accessible style Though the book is not a review the articles form a coherent and comprehensive overview of issues which will be of interest to a wide readership I recommend the book particularly to those interested in public health and social sciences

J T Graham
Lieutenant Colonel RAMC

How to survive in Anaesthesia P Neville Robinson and George M Hall BMJ Publishing Group February 1997 Pp 192 UK £19 95 Overseas £22 00

This is not a proper textbook and not should I as a trained anaesthetist have read it (the authors say so in the preface) but it is remarkably good value It is highly selective in the subjects covered, but the topics addressed are dealt with in a lucid and remarkably comprehensive manner for such a small volume The serious content is leavened with anaesthetic humour throughout The trainees who have seen the book were unanimous in their approval of both content and the cartoon on the front cover but disappointed that there were no cartoons inside to accompany some of the more scurrilous statements in the text It has been written by anaesthetists for anaesthetists in training and as such is probably not the best reading matter for a potential anaesthetist doing general duties Nonetheless it will entertain and inform trainees in their first few months (or even longer) and probably induce apoplexy in any surgeons who read it The only deficiency in this survival guide is that it does not even attempt to outline how to give a basic elective general anaesthetic concentrating as it does so admirably on patient assessment, resuscitation skills equipment, management of complications and anaesthetic considerations for particular specialties A short discourse on the Nuts and Bolts section on something to put them to sleep something to keep them asleep something to stop the pain and something to keep them still would have plugged the gap without altering the philosophy of the book

Jane E Risdall
Consultant in Anaesthetics and Intensive Care Royal Hospital Haslar

Sense and Sensibility in Health Care Ed Marshall Marinker BMJ Publishing Group November 1996 Pp 296 UK £19 95 Overseas £23 00

This is a collection of six essays on health care policy commissioned by Merck, Sharpe a Dohme for reasons altruistic, and informed think tank discussions Marshall Marinker revie them in 17 pages of polished epigrams The firs about how public health consultants must netwo or die for nobody welcomes their intrusions they to be upbeat about it Then Grham Black examines the conflicts of doctors as patien champions as managers and as researchers, a prefixes with Hippocrates "Life is short, art lo opportunity fleeting experiment treachero judgement difficult. Quite He points out that GMC s Duties of a Doctor Is essentia Hippocratic too and that being professional is always positive A G Pheut takes up the theme of a good idea but as he examines evidence-ba medicine The outcomes disproportionate dissecti of the Jaymee B case, or Trial by Mirror (epigram) Peter Gravett and I were Gurkha M together so I was up to speed Conclusion? W there you are then that show these things are Sl interesting and readable Anna Coote then expla that the NHS is not democratic and shows how could be Add finally comes John Spiers of t Patients Association with 170 pages straight fu patients corner Witness This medicalised idea which Tony Hope has called 'the Proto Presumption —is now being re-emphasised Marshall Marinker has emphasised too that po modern reality offers more than one reality Wh about Medicine and health care is both existent and societal or technologies are not merely ab what Jacques Elful calls 'in technique" I th underneath he may have had something to say bu could not see through the peacock feathers Perh this coloured my perception of the whole book I for philosophers and poets and those with time reflect I reflect what a very inefficient way this inform oneself by reading books

Brigadier P Lynch MD FR(
Director Personnel and Servic
Defence Secondary Care Agen

Heart Disease in Pregnancy Ed Celia Oakle BMJ Publishing Group November 1996 Pp 41 UK £69 95 Overseas £73 00

This book will serve as a very useful referen work for obstetricians and cardiologists There comprehensive coverage of the circulat conditions that can complicate pregnancy and t more commonly encountered problems are de with in depth What is particularly impressive

detailed and balanced manner in which the ormation provided in the statements made are renced from the literature. The impression en is that the clinical recommendations made as a result of a careful synthesis of the relevant nature. The referencing also makes the book a y useful starting point for clinical sultations.

The book has 19 contributors in addition to Dr ley. There are 442 pages and 30 chapters. The earance is slightly old fashioned with only all black and white inset images and occasional phs and electrocardiograms. In several of the pters there is a series of pages of pure text ken only by sub headings despite this the text ell written throughout and there are a number seful tables presented in the BMJ key points le.

The book is priced at £69.95 and I would ommend that a copy is available in hospitals viding obstetric service where cardiovascular plications during pregnancy may be ountered.

Dr G A Haywood
Consultant Cardiologist
Derriford Hospital Plymouth

p to Shore A Dictionary of Everyday Words d Phrases derived from the Sea Peter D ns. ABC Clio Ltd Oxford. June 1996. £19.95

reatly enjoyed browsing through and dipping this well presented hardback dictionary of yday words and phrases derived from the sea. I encourage readers to explore into its ginating derivations and usages. It is best haps to read it alone as one can become tedious ting those with you to share frequently in ils as you come upon them.

This is among the more serious examples of this re and expresses the meaning, usage and nical derivation/usage of many well and to me least, little known words and phrases from the and present which enrich both the sailor's and landlubber's speech together with a relatively which have remained largely in the language he sea. The net is cast very widely to encompass ipment such as anchors, common phrases such Clear your yardarm the more mysterious mplified by to sham Abraham and some her tenuous nautical links exemplified by the ry for mayonnaise. Readers will have to do r own research to more fully appreciate these narks! Illustrative quotations from literature are vided as margin notes to enrich enjoyment and, for the scholar and speech writer, application of the language. While there are some line drawings principally and very usefully to illustrate ship types and equipment, the opportunity to usefully fill the blank pages between many alphabetical sections with more illustrations has been lost.

Peter Jeans certainly achieves his aim of illustrating the astonishing debt our idiomatic speech owes to the nautical language of the past. This book is a must for naval libraries and would give pleasure to those who add it to their own bookshelves.

G H G McMillan
Surgeon Commodore
MOIC Institute of Naval Medicine

Emergency Triage Ed. Kevin Mackway Jones. BMJ Publishing Group. November 1996. Pp 168. UK £12.95, Overseas £15.00.

As all French scholars will be aware Triage is derived from the verb *trier* meaning to sort. Triage is used to sort patients according to clinical need and allocate them a treatment priority. This book is primarily intended for use in British Accident and Emergency (A&E) departments. It will only have limited application to triage in military situations where medical facilities can become overwhelmed and non clinical factors also need to be taken into account.

The authors are the Manchester Triage Group a group of senior emergency physicians and nurses who set out to establish a national consensus and have successfully developed a five-point National Triage Scale. The scale is being widely adopted throughout the UK and should enable consistency and also valid comparison between A&E departments.

The book is in two sections: the first takes the reader through the analytical processes required in triage and discusses the triage method. I personally found the use of boxes repeating much of the information contained in the text unnecessary and, interestingly these boxes were dropped for the final chapter in this section. The second section is a series of 52 alphabetically arranged presentational flow charts (e.g. abdominal pain, crying baby, fits etc.) which use various discriminatory questions to allocate any patient to one of the five triage categories. This information is well presented and all terms used are clearly explained in a glossary at the end of the book.

The book is a valuable reference which should be readily to hand in all A&E departments and the

these diagrams in particular will be useful *aide-memoire* for nursing staff involved in civilian triage However I cannot see the need for all serving military medical personnel to own a copy because of the already referred to differing priorities in military triage For those working in A&E departments *peut être!*

M A Howell
Senior Registrar in Accident and Emergency
Medicine Bristol Royal Infirmary

Effects of Atomic Radiation A half-century of studies from Hiroshima and Nagasaki William J Schull John Wiley and Sons Ltd 1995 Pp 397 £45 00

At 0816 local time on 6 August 1945 a B 29 bomber the Enola Gay dropped a 12 kT TNT equivalent Uranium fission weapon named Little Boy over Hiroshima Three days later Bock s Car dropped a 22 kT Plutonium weapon over Nagasaki Within the first four months 64 000 people had died in Hiroshima and over 39,000 in Nagasaki with a further total of five casualties topping 97 000 This book presents the accurate comprehensive and definitive results of the momentous fifty year follow up epidemiological studies of the Atomic Bomb Casualty Commission Its author is a world renowned radiation geneticist who was involved with the Commission from the very beginning

Schull has written in simple straightforward language Clearly with a wider audience in mind, he explains at length the more complex concepts and includes an excellent glossary of terms This does not, however detract from its value to the professional being both an exceptional technical manual and a fascinating historical journal The data he provides undeniably separates fact from fallacy and is a must for all those with an interest in the now so emotive global nuclear debate

This book s unique ability to combine high s complex and technical information with ensured readability will ensure its popularity both with the well read layman and the professional The Effects of Atomic Radiation is therefore highly recommended

B C C Toma
Surgeon Lieuten
Medical Officer HMS *Vigil*

ABC of Urology Eds Chris Dawson and Hugh Whitfield BMJ Publishing Group January 19 Pp 60 UK £14 95 Overseas £16 00

This clear concise practical guide edited by Ch Dawson and Hugh Whitfield has a wide potent market. When one considers that urologi disorders account for one third of all surgi admissions to hospital one can see the potent importance General Practitioners Medi Students and those starting a career in surgery w find this an informative well illustrated a concise introduction to what is in post fellowsh subject There are one or two didactic comme that could be questioned and in particular the suggestion that urology should only be practis in large Units with about six Consultants is another worrying sign that we may be trying change the practice of District General Hospita

Overall however I would commend this bo to be kept in the main library and in urologi department libraries as an easily read sh overview of the subject

D N Tullo
Head of Urology Departm
Royal Hospital Has

Obituaries

Lieutenant Adrian James Skinner, Royal Navy

Adrian Skinner died at home on 24 May 1997 aged

He had a successful Naval career rising ugh the ranks to become a Lieutenant in 1992 le joined the Royal Navy in 1976 as a Junior dical Assistant where he undertook training at *HMS Raleigh* and RNH HASLAR before joining *HMS Hermes* for a short time He practised his ls on the wards and in the Casualty artment of RNH PLYMOUTH from 1977 the Spring of 1980 when he became a mando Medical Assistant He spent time 41 Commando and at Deal before returning he Portsmouth area working both at RNH SLAR and HMS *Centurion* where he had his taste of working with the Royal Naval and al Marine Reserves

1989 as a Petty Officer Medical Assistant he HMS *Sultan* for Britannia Royal Naval lege and emerged as a Sub Lieutenant ready for first appointment at RNH HASLAR in 1990 er a short spell of general duties Adrian rned to the Commando Logistic Regiment as 3 op Commander

During his time with the Logistic Regiment he loaned to the United Nations for a six month rational tour as an UN observer (UNO) in the Transit Authority in Cambodia (UNTAC) Royal Navy and Royal Marine UNOs were to Cambodia as part of a multinational force ssist the UN who were managing the transitio n the Khmer Rouge military dictatorship led Pol Pot in a democratically elected ernment Adrian spent some time as one of the ations Officers in the HQ in Phnom Penh ching the activities of the UNLOs and also nt time at the bases on the coast at Siem Reap the large inland lake which dominates mbodia, the Tonle Sap It was highly llenging appointment in a very dangerous ronment in which he did well After returning man used in joke that before he went to mbodia the thought that the Khmer Rouge was Asian Red Wings it was not until they kidnapped of his colleagues that the harsh truth of the ation dawned on him

Following his exploits in Cambodia Adrian nd himself in slightly calmer waters when he ed JNM as firstly Research Officer in Human tors and then later as Research Officer Survival where he will be especially remembered for his sterling efforts during the production of the finest training video on Cold Injury The film crew were greatly impressed with his knowledge professionalism and fertile imagination which led to the improvisation of some novel props to illustrate specific cold injuries

After two and half years at JNM Adrian moved to Victory Building in February 1996 as Command Medical Administrative Officer where he was largely involved in matters relating to the Royal Naval Reserve Highly conscientious and very popular he strove hard until the last to develop with the Reserve Forces the skills and standards expected of them and to help put in place the policies necessary to take them forward into the Millennium

Adrian Skinner will be sadly missed by all the uniformed and civilian colleagues who knew him.

A further tribute to **Lieutenant Skinner** has been received from *Surgeon Captain John Maitland RD RNR Director Medical Reserves*

The whole Branch mourns the loss of Lieutenant Adrian Skinner RN CMAO We pay tribute to his enthusiasm hard work and dedication in supporting the Branch He was a breath of fresh air and had the capacity to get things done He could be forthright but was always sincere and loyal All of which makes his loss hard to understand and difficult to bear especially for his family Our thanks for his life and memory go to his family

We have recently learned of the death of **Surgeon Captain Patrick Blaikie Nicol** on 28 May 1997 **Surgeon Captain Gerald Sutherland Irvine CBE** on 3 August 1997 **Surgeon Lieutenant Commander Hugh Stirling RNR** on 4 April 1997 **Surgeon Commander Douglas Craig Lillie VRD RNVR** on 13 May 1997 **Miss Dorothy Adie Stuy ARRC QARNNS** and **Mrs Kathleen E A Pole** (née Finnell) **ARRC QARNNS**

Our sympathy is extended to the relatives and friends of all of the above any personal reminiscences will also be welcomed by the Editor

Royal Naval Medical Service 1997 83.2 104–107

Service News



[illegible] TMSV [illegible] Chief Petty Officer Medical Assistant L. P. Yeoman RNSC Dart[illegible] the Meritorious Service Medal by the Second Sea Lord Admiral Sir Michael Boyce KCB OBE ADC

PROFESSIONAL ACHIEVEMENTS

Surgeon Commander C. J. Churcher Brown has been appointed Consultant Adviser in Psychiatry to Medical Director General (Naval)

Surgeon Commander J. R. Broome as Consultant Adviser in Underwater Medicine to Medical Director General (Naval) and Defence Adviser in Diving Medicine to Surgeon General and **Surgeon Lieutenant Commander Christopher Low** Consultant Adviser in Ophthalmology to MDG(N)

Diploma in Aviation Medicine

Surgeon Commander A. V. Balmer and **Surgeon Lieutenant M. R. Groom** have gained the Diploma in Aviation Medicine

Fellowship of the Royal College of Surgeons

Surgeon Lieutenant Commander S. R. C. Smith has been awarded the Fellowship of the Royal College of Surgeons

Specialist Registrar Status

The following officers have been granted Specialist Registrar status in the specialties shown: **Surgeon Lieutenant Commander M. Groom** (Occupational Medicine) **Surgeon Lieutenant Commander S. Toase** (Anaesthetics) **Surgeon Lieutenant Commander R. Thomas** (Anaesthetics) **Surgeon Lieutenant Commander J. G. Sharpley** (Psychiatry)

Completion of Specialist Training

Surgeon Lieutenant Commander N. Hedger has been awarded a Certificate of Completion of Specialist Training in Renal and General Internal Medicine

Armed Services Consultant Approval Board

Surgeon Commander S. Ryder has been appointed a Consultant in Occupation Medicine and **Surgeon Commander J. Rysdall** a Consultant in Anaesthetics



R[illegible]ert Lott Award
M[illegible]ical Assistant Julian Fell form[illegible] [illegible] Award. The award was for Best Student [illegible] [illegible]itute of Naval Medicine. As part of that course [illegible] [illegible] is currently serving on HMS *Vanguard* (Port [illegible] [illegible] Captain John [illegible] Maintenance, [illegible] cheque for £30 which accompanied the award [illegible] Officer Lieutenant [illegible] pictured (right)

Q[illegible]een Alexandra's Royal Naval Nursing S[illegible]vice Association Annual General Meeting [illegible] Reunion

O[illegible] hundred and six former and serving [illegible]RNNS Officers gathered at the Institute of [illegible]al Medicine on Saturday 21 June 1997 for the [illegible] Annual General Meeting and Reunion of the [illegible]RNNS Association. The President Miss [illegible]thea Cooke CBE and the Chairman Mrs Ann [illegible]ce welcomed members from all parts of the [illegible] and abroad. A message was read from the [illegible]ident HRH Princess Alexandra who sent her [illegible]est good wishes for the occasion.

[illegible]he day began with coffee followed by lunch [illegible]wing the opportunity for a great deal of talking [illegible] laughter! The weather was kind and members [illegible]oyed the lovely grounds and facilities of the [illegible]itute and were pleased to be able to view the [illegible]RNNS memorabilia now on display in [illegible]ckton House and to have a home from which to continue collecting and displaying archive material. The day ended at 1600 to be followed by numerous private parties to continue reminiscing.

Next year the AGM and Reunion will be held at The Union Jack Club in Waterloo on Saturday 20 June.

Among the members who attended the Reunion was **Mrs Agatha Tinne** (formerly Dampier Child) who served in the QARNNS Reserve from 1941 to 1943 and who had the opportunity to see on show items she recently donated to the QARNNS collection: the dressed doll Jack the boy seaman wounded at the battle of Coronel in 1914 and since used to collect monies for the comfort of wounded sailors in both World Wars, and the Blue Ensign (RFA) and Red Cross flag flown by HMHS *Vita* whilst embarking casualties from Reggio and Salerno Beaches in 1943 and subsequently in the Indian Ocean.



[illegible] Commander I h Dalgleish [illegible] Army Medical Services, [illegible] Lt-Gen M Ge[illegible] R Sh[illegible] General Army Medical S[illegible] [illegible] patients [illegible] Exposito[illegible] The presented silver gilt medal [illegible] Medical Officers, [illegible] meeting of Medical Officers at Netley in 18[illegible] [illegible] Dr Farr, M Yeo, Dr Parkes MD FRCP FRS, the Professor of Hygiene, in the Army Medical S[illegible] [illegible] ng from 1860 to 1876. (See abstract on page 86)

ROYAL NAVAL MEDICAL AND DENTAL OFFICERS

PROMOTIONS

Provisional Selections for Promotion to date 31 December 1997
To Surgeon Captain
C J Churcher Brown

To Surgeon Commander
A P Roberts C J A Edwards A W Murrison

To Surgeon Commander (D)
A B C Maxwell S J Liggins

Provision Selections for Promotion to date 30 June 1998
To Surgeon Captain
A R Mugridge

To Surgeon Commander
G E D Howell P A Hughes M H Lygo

To Surgeon Lieutenant Commander
D G S Blair L B Cannon D J Connor
N G Fisher D J Kerr R C Thomas
M A Whittaker

NEW ENTRIES
Surgeon Lieutenants (D) T C Dean
B J Huxtable
Surgeon Sub Lieutenant J A J M Read

RE-ENTRIES
Surgeon Lieutenant Commander J M Clark

PLACED ON EMERGENCY LIST
Surgeon Lieutenant Commanders P Billingsl
A T Dewhurst S J Leigh Smith
M C O Tant, G H Ogden K M Rawal

RELEASED ON COMPLETION OF SHORT CAREER COMMISSION
Surgeon Lieutenant Commander (D) J G Dav
Surgeon Lieutenant V J Stevenson

RETIREMENTS
Surgeon Commander C J Cahill

MEDICAL SERVICES

RETIREMENTS
Acting Commander D J Golding
Lieutenant Commander A Harrington

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

APPOINTMENTS AND PROMOTIONS

Provisional Selection for Promotion to date 31 December 1997

To Lieutenant Commander
H L Aitkins

TRANSFERS TO 8-YEAR SHORT CAREER COMMISSION
Lieutenants C J Piper C J Robson

NEW ENTRIES
Lieutenants A L Beare K Downey
K A Hurley J A Milner

RELEASED ON COMPLETION OF SHORT CARTER COMMISSION
Lieutenants P A Clyde
L Jones L Mortlock

ROYAL NAVAL RESERVE

PROMOTIONS

Provisional Selections for Promotion to date 30 September 1997

To Surgeon Commander
P K Small J M Norwood

RETIREMENTS
Surgeon Lieutenant Commander A N Cade
Vivid

Formation of Commando Gunner Club

29 Commando Regiment Royal Artillery announces the formation of The Commando Gunner Club. Membership is open to all who have served in the Commando Gunner Regiments since their formation in 1962

For a membership application please write to
Tom Browne
The Secretary
Commando Gunner Club
29 Commando Royal Artillery
The Royal Citadel
PLYMOUTH PL1 2PD

or telephone/facsimile 01752 263143

Notices

Management Committee

Surgeon Commodore G H G McMillan *(Chairman and Editor)* Surgeon Captain (D) J V Holland Surgeon Captain R Curr Commander I B Gould QARNNS Surgeon Commander R F Dale Commander F Reed Surgeon Commander R H Taylor Surgeon Commander P I Raffaelli Mrs J Southwell *(Secretary)* Dr R J Pethybridge is the Editor's Statistical Adviser and Surgeon Captain (D) E J Grant (Reid) is the Journal's Assistant Editor

Notice to subscribers

A Winter, Spring, and Summer edition of the Journal of the Royal Naval Medical Service is published each year one volume comprising three issues The rates of subscription are

1. Serving and retired RN and RNR personnel members of the Army and Royal Air Force Medical Services Consultants to the Royal Navy other MoD or civilian personnel—£12 00 per year post free
2. Personnel as listed above aged 65 years and over who have subscribed continuously for 25 years or more—£9 00 per year
3. All other categories—£15 00 per year

All communications relating to subscriptions, notifications of change of address etc should be directed to the Editorial Secretary JRNMS Institute of Naval Medicine Alverstoke Gosport Hants PO12 2DL or telephone 01705 768310

Notice to Advertisers

Details of advertising rates and technical details are available from the the Journal's agents Combined Service Publications Ltd PO Box 4 Farnborough Hants GU14 7LR

Notice to authors

Contributors to the Journal of the Royal Naval Medical Service are reminded that the full text of Notes to the Authors was published in the Summer 1994 issue and are advised to consult this before submitting papers to the Editor for consideration for publication in the Journal

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pa[illegible] [illegible] [illegible] R[illegible]N[illegible]M[illegible]l Sc[illegible]ks. All [illegible] [illegible] [illegible] [illegible] M[illegible]
with a[illegible] [illegible] [illegible] [illegible] the Editor

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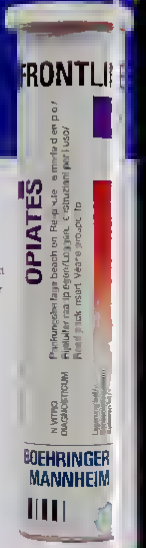
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the
Royal
Naval
Medical
Service

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Technical Diving
Testicular cancer; an occupational disease?
Cholera and the Royal Navy
Service News

Journal



NAVAL MEDICAL COMPASSIONATE FUND

The Naval Medical Compassionate Fund (NMCF) was created in 1915 for the benefit of widows and orphans of Naval Medical Officers, active and retired, who were subscribers to the Fund when they died. It replaced the Naval Medical Supplemental Fund Society which had been set up by Order in Council on 13 August 1997.

Progressive modifications of the Fund have taken place and serving medical officers may currently join on payment of a life subscription, actuarily derived, which varies between a minimum of £13 65 and a maximum of £50 40 dependant upon age and sex at time of subscription.

On notification the death of a member the surviving widow/widower or orphans will receive a lump sum, currently set at £1800 00, paid within 48 hours of notification. Subscribers must be on the Active List of Medical Officers of the Royal Navy at the time of joining but will, as life members, continue as members after being placed on the Reserve or Retired Lists or after resignation of commission. SCC officers are eligible to join. Officers on the Retired List who were Annual Members and have ceased to subscribe may rejoin the Fund on payment of all arrears.

All enquiries should be addressed to MDG(N)'s Secretary (ex-officio Acting Secretary of the NMCF).

Naval Medical Compassionate Fund
Office of the Medical Director General (Naval)
Room 114
Victory Building
HM Naval Base
PORTSMOUTH
Hants PO1 3LS

The date of the Annual General Meeting is set for 1430 on Thursday 21 May 1998 in the Duncan Room, Victory Building, HM Naval Base Portsmouth. Members wishing to attend are requested to advise the Acting Secretary in advance.

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Cover illustration: *Badge of the Royal Defence Medical College*



New Entry Medical Officers Course 1997

From left to right (Back Row) Surgeon Lieutenants A D Kehoe D J E Kershaw M Mantle P S C Rees and J D McIntosh *(Centre Row)* Surgeon Lieutenants S D Hutchings M Henry D R McAllister K R E J Prior S L Shaw and L M Armstrong *(Front Row)* Surgeon Lieutenant E Tickle E J Beadsmoore and L A Whybourn MDG(N) Surgeon Rear Admiral M P W H Paine QH Snb Lieutenant R G Manwaring (TG Med) Surgeon Lieutenants W A M Dow and J Rahman

Competition remains healthy among medical students and young doctors seeking to join the Royal Navy as Medical Cadets and junior Direct Entry Medical Officers and once again the annual requirement has been met whilst maintaining very high standards.

September saw 16 New Entry Medical Officers pictured above with the Medical Director General (Naval) report to the Institute of Naval Medicine to embark on the final laps of their journey to join the trained strength of the Royal Navy. Soon they were moving west to join the general make to the Royal Naval Britannia College Dartmouth for seven weeks to train in the more general and military aspects of the Royal Navy in company with new entries from all branches and to le[arn] much about themselves and their peers in process. At the end of their course much m[ore] officer-like than on entry and having attain[ed] sufficient excellence in parade drill to follow [the] recently established tradition of marching throu[gh] the College doors on conclusion of their fi[rst] Divisions they passed out. The penultim[ate] modules were based at the Institute and inclu[ded] instruction in undersea aviation and clinical a[nd] field combat medicine. They then completed t[heir] Divisional Officers' Course at the Royal Na[val] School of Leadership and Management bef[ore] moving to their first operational appointments. n excellent entry we wish them fair winds!

Editorial

Building on successes at Haslar

Identifying the forces pushing the future rather than those that have dominated the past will ... less the power to engage with our reality John Naisbitt

History holds the lesson of the vital perhaps vital contribution to be made to the success of military and naval operations by commanders having available to them sufficient appropriately trained, equipped and motivated medical staff. While the environment in which these personnel now serve predominantly in their own Service will drive their training to a significant extent the reimportance of medical interoperability and economies to be made by the three Services coming together more than previously have in appreciated. The Update in this edition ures one outcome of this policy the eloping Royal Defence Medical College ort Blockhouse.

The training complex formed by this and the oining Royal Hospital Haslar must be the y of many medical communities. The plementary establishments bear testimony to wisdom and foresight of those who selected m as the foundation upon which the Defence ondary Care Agency could build to meet primary aim to make hospital trained sonnel available to Commanders in Chief for rational duties.

While the solidly built Royal Hospital Haslar y have its share of the problems inherent in er buildings it also has the benefits of a long rich history and much state of the art hnology such as its MRI scanners new Burns Intensive Care Units and the most advanced perbaric Medicine Centre in the South East. It ets the challenges of providing operational dical staff as required by the Commanders in ief and also peacetime health services to Defence personnel and members of the civilian community in which it lies the busily developing borough of Gosport. While these local people have National Health Service secondary care units almost within sight across Portsmouth Harbour these are separated from them by miles of often congested road...they greatly value the significant and once again increasing contribution to their health care made by Haslar's consultant-led clinical services.

Of course quite intentionally the resulting richly varied workload provides the very essence of good training for medical officers nurses and technicians. Moreover Haslar provides excellent training placements for the Royal Navy's unique Medical Assistants to apply under the supervision of experienced Service medical staff the skills they have learned in the classroom and will take with them to their operational duties. While many other hospitals strive in vain to find space to develop staff accommodation and postgraduate training facilities Haslar now has these assets literally on its doorstep through the progressive closure of the submarine base and other facilities at HMS DOLPHIN and their transfer to the College.

No doubt continuing opportunities will present to increase Haslar's integration with Portsmouth hospitals for mutual benefit to provision of care and training. If these arrangements are objectively yet imaginatively designed to build for the future on the obvious strengths of the Service's Gosport complex the Defence Medical Services operational commanders and the people of Gosport and Portsmouth will all be served well.

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Member of the Association of Service Newspapers

Updates

Queen Alexandra's Royal Naval Nursing Servic e



On 3 October 1997 the historical link between the former Royal Naval Hospital Plymouth QARNNS Plymouth City and the Stonehouse Community was recognised, when the Plymouth Chamber of Commerce and Industry and Courtleigh Property Holdings Ltd renamed the former hospital s quadrangle Queen Alexandra Square The former wards which surround the quadrangle are named after previous Governors and Medical Officers in Charge of the hospital They now house new business ventures in a campus which gives opportunities to members of the Plymouth and Tamar area business community to forge new contacts and assist in the Government s New Deal Youth Employment Policy Two Nursing Officers three Naval Nurses and I attended the renaming ceremony undertaken by the Commodore of Devonport Naval Base Commodore J Burch Plymouth City the landlord and businesses are also keen to undertake a sensitive regeneration project and ensure that the history of RNH Plymouth is not lost The aim is to make provision for the local community to enjoy the bountiful gardens and solitude the site allows so near to the city cent The link has already been established The Primary School next door to RNH has its o flower bed and the children are taught to care and tend to the bushes and plants in their dedica plot Those of us who attended felt nostalgic it was truly a visit down memory lane but wh wandering around the grounds we felt the absen of our patients

At the end of September the Surgical Suppor Teams of RNH Haslar and MDHU Derriford were their element with smiles all round as the Roy Naval Medical Branch and QARNNS operat together during 3 Commando Brigade s Exercis Rolling Deep This gave the teams opportuni to exercise their support role to the Royal Marines in field conditions by casualty handling within the new Deployable Rapid Assembly Shelt (DRASH) tentage and evacuation of patients to and from helicopters These exercises are vitally important for all since neither the Surgi Support Teams nor the Royal Marines can work in isolation from each other The exercise provide a training ground for the efficient and effect e merging of the two elements into one

During October the Reserves undertook th two week Medical Training Period at Sarglea Camp Whilst QARNNS Reserves are underbor those who are serving are strongly committed t the standard of training for the Medical Suppo Assistants that I witnessed was progressive a strong The Probationary Medical Support Assistants who come from all walks of life were highly motivated and are being taught by a dedicated te in the principles of triage, first aid and basic nursi skills Observing the capabilities of our QARNN Reserve colleagues only strengthens my belief in their skills and specialist knowledge will enhan the regulars in time of tension or war

On the rationalization of Terms and Conditions of Service for the Defence Nursing Services the Tri Service Working Group continues explore all avenues Whilst it is known that the differing Terms of Service between the thr nursing Services do cause disharmony and

satisfaction [illegible] changes will need to be carefully managed taking the time to get it right. I therefore appreciate and thank all QARNNS personnel for their patience and for maintaining continuing professionalism in the care of our [illegible] during this period of change.

PM Hambling ARRC QHNS
Captain QARNNS
Matron in Chief

The Royal Defence Medical College



The Millbank component of the Royal Defence Medical College (RDMC) moved from London to HMS Blockhouse, Gosport in August 1997 to amalgamate with its Health Studies Division (HSD) and co-locate with the Royal Hospital Haslar. The move has re-established the vital link between undergraduate Medical College and Service hospital broken on the closure of the Queen Alexandra Military Hospital Millbank in 1977.

Background

In response to the *Front Line First* initiative Defence Cost Study 15 (DCS 15) canvassed to identify opportunities for financial savings within the Defence Medical Services (DMS) inevitably involving significant reorganisation and downsizing. DCS 15 proposals included the abolition of single Service Deans with an incorporation of their function under one tri-Service Postgraduate Dean. Subsequent refinement of the concept led to the foundation of the Defence Medical Training Organisation (DMTO) responsible to the Surgeon General for all aspects of training within the DMS. DMTO launched in April 1996 under the two-Star leadership of the Director General Medical Training (DGMT) and achieved Agency status in April 1997 with DGMT as its Chief Executive.

Organisation

DMTO has two training wings: one at Keogh Barracks near Aldershot responsible for *military and paramedical military* training and the Royal Defence Medical College responsible for *professional* medical training. The Commandant of the RDMC is the Defence Postgraduate Medical Dean (DPMD).

The RDMC has formed in five divisions: Defence Postgraduate Medical Deanery (DPMD); Postgraduate Medical Education (PGME); HSD; Defence Medical Library Service (DMLS); and Defence Medical Entomology Unit (DMEU). HSD is responsible for the training of Nurses, Laboratory Technicians, Operating Department Practitioners and Health Care Assistants. It opened in temporary accommodation in HMS *Dolphin*, Gosport (adjacent to the Royal Hospital Haslar) in April 1996. The other components of RDMC had the privilege, albeit temporary, of inheriting the site of the Royal Army Medical College at Millbank SW1. RDMC has now moved into Horton Block, HMS *Dolphin*, but will ultimately occupy Mackenzie Block when the RN Submarine School moves to Plymouth.

The Purpose of the RDMC

RDMC is a ***provider*** and ***facilitator*** of postgradaate medical officer education pre- and post-registration nurse education and is responsible for the training of Operating Department Practitioners Medical Laboratory Technicians Radiographers Physiotherapists and Health Care Assistants including continuing professional education and personal develop ment It is a ***provider*** of some educational services where in house resources exist or can be accessed from Defence sources Others are facilitated by contract or other arrangement on a permanent or *ad hoc* basis

DPMD acts as the Regional Postgraduate Medical Dean for the DMS and respon sibilities initially included the incorporation of the Higher Professional Training (HPT) of medical officers into the Calman structure All HPT is conducted according to Calman or Joint Committee for Professional Training in General Practice (JCPTGP) requirements PGME facilitates all internal and external medical training in support of vocational and continuing professional education

HSD regulates standards by the use of recognised accreditation audit methods and external validation It has recently introduced a Diploma course for Military Nursing with the University of Portsmouth which will be extended to Degree status The Defence Medical Library Service (DMLS) is a ***provider*** of information books and journals etc to all DMS units and practitioners and the Defence Medical Entomology Unit (DMEU) is a ***provider*** of training and a source of advice to the DMS Full details of the functions of the RDMC are published in its Business Plan

The History of the College

The RDMC formed on the template and experience of the Royal Army Medical College

In 1857 the Royal Sanitary Commission was set up to investigate shortcomings in medical administration and professional training during the Crimean War (1854–1856) As a direct result of this and with the help of Florence Nightingale (1823–1910) and (Sir) Sidney Herbert (1810–1861 President of the Royal Sanitary Commission and later Secretary of State for War) the Army Medical School was established at Fort Pitt Chatham in 1860 In 1863 postgraduate military medical training moved to the newly built Royal Victoria Hospital at Netley on Southampton Water In addition to training Army doctors Indian Medical Service doctors were trained from 1865 and between 1871 and 1880 probationers from h Royal Naval Medical Service The Army Med al School remained at Netley for 39 years unt Royal Commission (1901–1903) after the B e War (1899 1901) recommended that a Milit n Hospital and Medical Staff College should be establ shed in London

In 1890–91 the Millbank Penitentiary w demolished Built in 1813 in a hexagonal n shape it covered 16 acres and contained more th one thousand cells linked by three miles corridors It could house 800 male and 400 fem prisoners The Millbank Penitentiary became embarkation point for many sentenced convicts their way to penal colonies in Australia Boats u up at the river steps to ferry prisoners to larger s anchored in the Thames Estuary An origi riverside hollard to which the boats were tied now in the McGrigor Courtyard of the RAM Headquarters Mess The demolition of penitentiary made way for the building of the T Gallery which was completed in 1897 and Queen Alexandra Military Hospital which open 1 July 1905 At the time it was intended to repl the three nearby Brigade of Guards hospitals was designated as a Military Station Hospital London It closed 1 March 1977

On another part of the Crown Estate two blo of barracks were built and completed in 1903 barracks which were later occupied by staff fr the College and Hospital were at first used by Army Service Corps The weather vane a r which was the emblem of the ASC dating from origins of the Corps as the Corps of Ro Waggonaers in 1794 remained until relativ recently

The Royal Army Medical College and RAM Laboratory Block were completed in 1907 a cost of £94 000 inclusive of laboratory electric light fittings The RAM College w officially opened on 15 May 1907 On 22 J 1908 the Senate of the University of Lond resolved that the Royal Army Medical Colle be admitted as a School of the University in t Faculty of Medicine for Officers of the Ro Army Medical Corps This status was withdra in 1932 because under new statutes of University of London Act 1926 the Sen insisted on some degree of financial control involvement in making appointments surprisingly this was not acceptable to DGAMS of the day

During the First World War teaching at college was suspended and the premises used the production of vaccines and later for resear

r > the protection against chemical warfare
h ly gas masks were developed here Teaching
l umed in 1919 along with research into
e ecteroides nutrition inoculation procedures and
n ny other projects
n June 1940 the QAMH was bombed and the
C llege was damaged in September As a result of
t the Department of Hygiene moved to
V chett from 1940 to 1943 The College Library
, also badly damaged Courses in tropical
d cine were maintained throughout the Second
W rld War when more than three thousand
d dical officers passed through the College and
r earch continued
The Royal Army Medical College retained its
n in providing and/or facilitating Army
d lergraduate and postgraduate medical
c cation until the responsibility of professional
d dical training was transferred to the RDMC on
1 pril 1996

T e History of Fort Blockhouse
I MS *Dolphin*)

I 1431 King Henry VI ordered that a tower be
h lt on the west side of the entrance of Portsmouth
H rbour for protection and to be known as
B ckhouse By 1714 the tower had become a fort,
t bastions of which still stand within the grounds
HMS *Dolphin* Many of the buildings of HMS
lphin were built between the two World Wars
h inside and outside the Fort in support of the
d veloping and expanding submarine service and
t Wardroom dates from 1925
The Royal Navy s first submarine *Holland 1*
e ered service in 1901 and was berthed alongside
t hulk of an old sailing ship HMS *Dolphin*
w ich was moored in Portsmouth Harbour until
1 04 when it was brought alongside Fort
B ckhouse The Royal Navy moved into the Fort
n 1905 to establish a submarine boat station The
n me of HMS *Dolphin* was given to the Fort area
a d the associated buildings although the ship
r mained alongside until 1923 Since then the
n me HMS *Dolphin* has been associated with the
S bmarine Service HMS *Dolphin* became the
h adquarters of the Submarine Service and the
b se of the 1st Submarine Squadron providing
h hly specialised engineering and logistic
s pport shore training and accommodation
At the outbreak of WWII submarines of the 5th
F tilla were based in HMS *Dolphin* carrying out
p trols in the English Channel the Bay of Biscay
t of the Spanish coast but in 1940 they were
dispersed to safer locations as the threat from the
Luftwaffe escalated Within the Fort area is the
Submariners Memorial chapel of St Nicholas
within whose sacristy wartime submarine
commanding officers opened and read their orders
for sea

Following the decommissioning of the Oberon
and Upholder class submarines there have been no
submarines based in HMS *Dolphin* However
HMS *Dolphin* still houses the Royal Naval
Submarine School (RNSMS) the Submarine
Escape Training Tank (SETT) and the Joint
Services Adventurous and Sail Training Centre
(JSASTC)

33 Field Hospital RAMC moved into HMS
Dolphin in 1996

HMS *Dolphin* decommissions on 30 September
1998 when RDMC becomes responsible for the
entire Fort Blockhouse estate RNSMS is due to
relocate to Plymouth in 2000 but the SETT will
remain

Achievements to Date

The RDMC opened in Fort Blockhouse for the
start of the 1997 98 academic year In addition to
the professional courses provided in HSD die
following courses for Officers have been
undertaken in the short time since the relaunch of
the College RAMC Postgraduate Medical
Officers Course (Part 1) DMS GP Registrars
Course RAF Medical Management and
Administration Course RAF Initial Medical &
Nursing Officers Course Minor Surgery for
General Practitioners Course and the Principles
of War Surgery & NBC Defence Course A full list
of training and available courses is promulgated
separately

The Way Ahead

It is recognised that the College is evolutionary
and it is intended to respond flexibly and
pragmatically to the changing needs for medical
education within the DMS It is intended to exploit
the new opportunities offered by co location with
the Royal Hospital Haslar such that the RDMC
develops as an inspiring and valued asset owned by
all who practice medicine within the DMS

I L Jenkins QHS
Surgeon Commodore Royal Navy
Defence Medical Postgraduate Dean and
Commandant of the
College

J Royal Naval Medical Service 1997 83 3 116–120

Adventure

An Introduction to Technical Diving

A Pitkin

Introduction

In the past it has been useful and appropriate to divide diving activities into military commercial and sport (recreational) diving. The training procedures, equipment and logistical support utilised in each field of underwater activity differed significantly enough to allow clear dividing lines to be drawn. Over the last two decades, sport divers have begun to use new techniques to access underwater environments previously restricted to commercial or military divers, and in some cases to explore areas (such as underwater caves) which are not met with commercial or military diving procedures. This approach has prompted use of the term 'technical diving' to distinguish such diving activity from the vast majority of sport divers using traditional techniques and equipment.

What is 'technical diving'?

Technical diving is not new, but its distinction from other recreational diving activities has only become apparent over the last decade. Adventurous sport divers have often exceeded the recommended limits of their training for a variety of reasons, sometimes with care and foreknowledge of the potential hazards, but more often with a naive disregard of the physical and physiological dangers which governed the setting of those limits in the first place. Over the past few years the formation of self-instructed training agencies for technical diving has led to the appearance of training courses in so called 'extended range' diving with the adoption of *de facto* standards and procedures often modified from existing military or commercial ones.

Technical diving often but by no means always involves deep diving. Building on the definition applied by the South Pacific Undersea Medicine Society (SPUMS), it is diving in especially demanding conditions such as underwater caves, penetrating wrecks and other overhead environments. It includes use of more than one breathing gas or one of the new generation of closed and semi-closed circuit rebreather systems which are beginning to become available on the recreational diving market. Deep diving on air and sports diving using only enriched oxygen nitrogen mixtures ('nitrox') are not considered to be technical diving.

Technical diving procedures

Use of gas mixtures other than air during a dive is a direct consequence of avoiding the known hazards of breathing compressed air at depth. Commercial use of oxygen helium ('heliox') mixtures along with saturation techniques has extended the range of the working diver to depths (over 500 metres) previously restricted to one atmosphere submersibles. Several decades of experience have resulted in a set of commercial diving regulations in the UK which are among the safest in the world despite being used in some of the most inhospitable arenas (such as the North Sea). The cost has been the immense and expensive logistics necessary for safe support of the diver at the workplace. Those practices include use of surface-supplied diving helmets, hot water suits and decompression chamber systems beyond the financial reach of even the most well to do sports diver. Accordingly the approach which has been adopted is more akin to that of the military diver who may need to be self contained for operational rather than economic reasons.

To reduce the narcotic effects of breathing a high partial pressure of nitrogen, technical divers dilute their breathing mixture with a quantity of helium which has no discernible narcotic effect. This also reduces the percentage of oxygen in the mixture, reducing the partial pressure of oxygen at a given depth to prevent central nervous system oxygen toxicity. The resulting mixture of oxygen, nitrogen and helium is known as trimix, a term which was coined during experimental deep diving research for the use of small quantities of nitrogen in an oxygen helium mixture to reduce

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effects it in thei physiological problem of p diving h gh pressure neurological drome (HPNS) Technical divers rarely reach depths (150 metres or more) at which HPNS t becomes apparent, and for them the use of ogen in the mixture is mainly for economic ons given the relatively high cost of helium

The significant quantities of gas used with ventional open circuit scuba equipment at th A secondary reason for the use of trimix er than heliox is to offset the high thermal ductivity of helium however the nitrogen in mixture will cause narcosis in proportion to its tial pressure although this can be adjusted to o l with which the diver is comfortable Other ors to be considered in determining the portions of helium and nitrogen in a breathing ture are a reduction in gas density and reasing thermal conductivity with increasing entage of helium

Use of such helium containing mixtures mediately presents additional operational dles to the diver The trimix breathed at depth y contain insufficient oxygen to avoid hypoxia r close to the surface and therefore a travel e, often air or nitrox is used with the diver iching to the trimix at depth Helium s high rmal conductivity and the risk of causing aneous isobaric counterdiffusion problems[3] kes it inappropriate for inflation of a dry suit l many technical divers carry an additional inder of suit inflation gas filled with air or argon hich has a thermal conductivity approximately f that of air)

Conventional air decompression tables clearly not be used with helium-containing gas xtures and commercial heliox tables are not erally available or simply inappropriate compression tables used by technical divers are ally generated by one of a number of mmercially available computer programmes ny of which utilise a conventional Haldanian del[4] but which have been extrapolated well ond the limits of their experimental testing A tain amount of empirical adjustment to make h tables more conservative and therefore sumably safer is generally used but from the ompression point of view most trimix hnical dives can be regarded as experimental es using untested tables A limited amount of ld monitoring has been carried out using data ging devices and Doppler ultrasound nitoring of venous gas bubbles[5,6] and some ompression table development was undertaken in the 1970s when the Royal Navy conducted [illegible] trials [illegible] countermeasures [illegible]

Decompression whilst breathing the bottom mix is inefficient because of its low oxygen content and a number of different nitrox mixes are typically used for the decompression stops often with 100% oxygen used at 6 metres or shallower[8] A typical trimix dive may therefore encompass the use of three or four gas mixtures air as a travel mix, trimix during the bottom phase of the dive an intermediate nitrox mixture (e g 40% oxygen) for use during the deeper decompression stops and 100% oxygen during the longer shallow decompression stops Multiple cylinders must therefore be carried mistaken use of the wrong mixture at depth is a real possibility which can be and has been on a number of occasions fatal in its consequences

Gas consumption when using conventional open-circuit scuba equipment increases proportionately with depth At 90 metres a hard working diver can consume the equivalent of 750 litres per minute A single 12 litre 232 bar cylinder commonly used for sport diving in the UK will last for less than four minutes at this rate of consumption and even at typical diving consumption rates a duration of about 12 minutes can be expected at this depth Double tanks (known as twinsets in the UK) are therefore often used by technical divers to carry sufficient bottom mix to handle emergencies

Whilst many open water divers have been diving beyond recognised sport diving limits for some years it is true to say that many procedures and equipment configurations now used in technical diving have their origins in cave diving particularly in the larger deeper underwater caves of North America and mainland Europe Use of larger and multiple cylinder configurations to extend the duration of breathing gas sapply the principle of equipment redundancy (take at least two of everything) and the rule of thirds (breathe one third of available gas on the way in leaving at least two thirds for exit and emergencies) were all developed by cave divers for longer and deeper underwater cave penetrations Many pieces of equipment such as powerful canister lights with a separate light head a long (2 metre) hose on one regulator (demand valve) for sharing air through restrictions reels for holding guideline and buoyancy compensators with increased lift capability to cope with heavy multiple cylinders were either adapted or designed specifically for cave diving and are now commonly used in technical diving Cave diving has for many years had a well defined set of procedures and training

programs which specifically address the problems of surviving in an overhead environment (i e one in which the diver cannot immediately surface in ae emergency) [8] A deep diver in open water could be regarded as having a virtual ceiling of decompression obligation also preventing direct access to the surface

Training in technical diving

There are a number of training agencies that have been set up to teach technical diving the best known in the UK and world wide are the International Association of Nitrox and Technical Divers (IANTD) and Technical Diving International (TDI) Various levels of certification are offered by them with coverage of various physiological and operational aspects of technical diving Whilst the standards laid down by them may not always have the most sound scientific basis they do at least attempt to avoid the hazards of nitrogen narcosis (deep diving on air is specifically discouraged) and oxygen toxicity Other topics covered include stress management, rescue techniques and equipment configuration. The student s in water skills should already be well developed by substantial sports diving experience

Comparison of technical diving with military diving

Technical diving has evolved more in the direction of military diving than commercial diving where the logistical approach employed (use of a diving bell surface supplied helmets hot water suits etc) is not operationally appropriate in the case of military diving or financially possible for technical divers Both technical and military divers tend to be self contained often with little in the way of surface support, utilising in water stops for most if not all of the decompression required and relying on the buddy system for aid in an emergency This may be contrasted with the mixed gas commercial diver who locks out of a diving bell at depth whilst a stand by diver remains in the bell the diver s umbilical will carry his breathing gas hot water supply and communications cable from the surface via the bell to the diver s helmet Most if not all of the commercial diver s decompression will take place in the dry either in the diving bell or in a decompression chamber an die diving support vessel [9]

The main differences between technical and military divers are, unsurprisingly in the realm of equipment. Deep bounce diving in the military arena is generally undertaken using a closed circuit rebreather set where the diver rebreathes the same gas which has been passed through absorbent to remove carbon dioxide and has an appropriate amount of oxygen added by electronic control system Such systems h clear operational advantages over open circ scuba – long duration and no bubbles – at the c of significant maintenance requirements Se closed circuit systems pre d ate closed cir systems and are still commonly used they w by adding a fixed flow of oxygen enriched ga the breathing loop at a rate which is determined the diver s likely oxygen consumption

Such systems are usually available only government organisations and are (for a spo diver) very expensive often because of the use exotic materials to achieve a low magnetic acoustic signature for clandestine operations well as the relatively high cost of research development for a limited market However a f military-derived units have found their way i the bands of sports divers and over the last f years there has been increasing interest within sports diving market in the use of semi closed fully closed circuit rebreathers for recreatio diving use A number of units have be manufactured some of which are clearly deri from a military system and some of which h been designed *de novo* for technical or spo divers At the time of writing (September 19 only one is actually available for purcha training in its use is offered by one of the techni diving training organisations and is a condition purchase How many of the numerous simi systems that have been demonstrated at prototype stage will survive to large s manufacture remains to be seen

Use of rebreather systems can expose unwary or inadequately trained diver to a numb of hazards not seen with open circuit syste Hypoxia is a possibility with any kind rebreather either through use of inappropriate mixtures and/or flow rates in the case of se closed systems or malfunction in the case closed circuit systems the risk of this minimised in military use by rigorous traini strict adherence to procedures and effect maintenance The onset of hypoxia is insidi and frequently not recognised befo unconsciousness occurs a sports diver with conventional half face mask and mouthpiece likely to drown Water entering the breathing lo will combine with the carbon dioxide absorbe (lithium or sodium hydroxide) forming a so call

astic cocktail which can cause alkaline
h mical burns to the mouth and respiratory tract
technical diving could be made significantly
r by the adoption of specified procedures
i ndardised equipment and drills characteristic
i military diving some technical diving groups
v olved in underwater exploration at the edge of
n self contained diving envelope have done so to
i nimise the risks of such extreme exposures Use
t support divers full face masks and dry
ompression habitats are becoming almost
nonplace in major projects (particularly
derwater olive exploration) [1]

V idents involving technical diving

W en technical diving began to proliferate in the
l some three to four years ago many diving
ficine specialists expected a significant
rease in the number and severity of diving
idents There was some concern over the
lity of standard oxygen recompression tables to
l severe decompressioc illness following deep
ince dives using helium although several
perbaric units in the country are now equipped
heliox administration and saturation
uments With one or two singular exceptions
expectation has cot been realised
published data Institute of Naval Medicine)
part this may be due to the small nnmber of
hnical dives being carried out in comparison
h the total nnmber of sports dives Another
planation could be a reluctance to seek
cialist medical advice in the event of minor
nptoms (e g limb pain) there is anecdotal
dence of self administration of snrface oxygen
nitrox amongst some technical divers It
pears that denial of decompression illness
CI) already common amongst sports divers is
pecially prevalent in technical divers in marked
ntrast to commercial and military divers who
rectly regard it as an occupational hazard A
rd explanation for the small nnmber of cases
n is thnt the distnnce between the technical
ver nnd the safety of the surface is snch that
jor problems occurring at snch depths are more
ely to lead to n fatality at depth than a live bnt
nred diver on the snrface

e future

an equipment intensive activity snch as diving
hnological advance is constantly redefining the
fety envelope Whilst the underlying principles
physics and physiology do not change they can
dealt with using equipment that is becoming
re sophisticated reliable and within the
financial reach of amateur divers One potential
problem is that technical divers are cow overtly
demonstrating thal apparently well founded
limits (especially of depth and environment) in
sports diving are not inviolate and they may be
encouraging sports divers who are less well
equipped and trained to venture beyond those
limits exposing themselves to the very dangers
thnt led to the formnlanon of the rules in the first
place

Many sports divers (who would not consider
themselves technical divers) are now breathing
oxygen nitrogen mixtures either for increasd
safety with an air table or dive computer or for
reduced decompression requirements nsing n
specifically designed computer nr decompression
table Availability of such mixtures is proliferating
rapidly without well defined standards of quality
control Labelling of gas cylinders becomes critical
to avoid nccidental use of an inappropriate mixture
with possibly fatal results in the case of cerebral
oxygen toxicity occurring nnderwater Many divers
appear to be adopting the home brew npproach
with little understanding of the hnzards of pure
oxygen at pressure The introducion of nitrox
training by major sports diving training agencies
snch as the British Snb Aqna Club (BSAC) nnd the
Professional Association of Diving Instructors
(PADI) will perhaps introduce a degree of
regulation into the industry

Use of rebreathers designed specifically for the
sports diver possibly represents the largest
potcntial growth area their clear advantage in
durnnon over open circnit equipment an
advantage which increases with depth will
ontweigh higher mnintknance and lraining
requirements lor their use Liability issues and
snbstantial devclopment costs have so far
restricted this sector of the market. Lower
component costs and mnnufnctnrisation of electronic
control components allow several redundant
backup ssstems to be built into such units with
consequent improved reliability

Sports diving equipment mannlacturers have
jumped onto the technical diving bandwagon with
some cnthusiasm It is not hard to see why the
principle of redundancy can be directly translated
into increased sales for them with additional gains
from marketing (for exnmple "nitrox com
patible versions of equipment at inflated prices A
few have profited by adapting products designed
lor commercial or military diving such as full face
masks and through water communications lor the
recreational market

Despite the prolifcration of new techniqnes nnd

equipment and techniques in the UK and abroad still uses open circuit compressed air. Conventional sport diving practices are unlikely to change much in the foreseeable future because of their proven safety record and low cost although a gradual percolation of techniques and equipment from technical diving to conventional recreational diving will perhaps result in a more knowledgeable and better-equipped recreational diver. Hopefully the undesirable converse scenario of the poorly equipped and untrained sports diver attempting technical level dives will not also become more common as technical diving grows in popularity.

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Clinical Management

Diagnosis and Management of Diarrhoeal Disease in Dhaka

Victoria J Price

I was a fourth year student at The University of Edinburgh medical school. I was required to undertake a short research project. I was fortunate to be able to travel to Bangladesh to investigate diarrhoeal disease in a children's hospital in Dhaka.

Introduction

Bangladesh is a developing country. 143 998 square kilometres in area with a population of 118 million. Eight million live in Dhaka, the capital which occupies 414 square kilometres. A high proportion live in appalling conditions in Bastis. The city's slum area. A basti is an area of houses made accurately shelters with cardboard, wood or bamboo walls and a roof of bamboo palm leaves. Lumps of material or old mattresses. A family of six or more would live in such a house with about six square metres between them for all their daily functions. The number of houses in any one basti can be as many as three thousand therefore up to 30 thousand people could be living in each others pockets like this. The water supply for these people is from tube wells, which vary in cleanliness or from surrounding rivers or lakes which are sometimes simultaneously used for laundry purposes. Thus as expected sanitary and hygiene conditions within the basti are atrocious. Also the proximity of living means that when one contagious condition breaks out in the basti it inevitably becomes an epidemic. Under these circumstances it is not surprising that there is a very poor level of health in Bangladesh.

Children under 5 years of age make up 17.1% of the country's population and that age group has a mortality of 117 per 1000 live births. Diarrhoeal diseases are a major cause of malnutrition and the leading cause of childhood morbidity and mortality in Bangladesh. Each year there are 60 million episodes of diarrhoea in children under 5 years old resulting in 260 000 deaths annually.[1] Repeated attacks of diarrhoea lead to malnutrition and poor growth because of decreased food intake, malabsorption and increased nutrient requirements.

World Health Organization (WHO) treatment regimes for diarrhoea depend on the clinical distinction between acute invasive dysenteric diarrhoea (the intestinal mucosa is invaded and there are resulting ulcerated inflammatory lesions) and non-invasive secretory watery diarrhoea.[1] The presence of visible blood in the stool is the official definition of dysentery and WHO recommendations consider this invasive diarrhoea. Compared with watery diarrhoea invasive diarrhoea usually lasts longer is associated with more complications and is more likely to adversely affect the child's growth and nutritional status. It is also more likely to predispose to persistent diarrhoea and to have a higher fatality rate.[4]

Fifty per cent of cases of bloody diarrhoea in children are caused by shigella species.[5] Therefore if invasive diarrhoea is diagnosed practitioners are inclined to assume shigella and treat accordingly because the economic situation of Bangladesh leaves bacteriological confirmation of the causative organism to the privileged few. However the clinical identification of shigellosis is not clear cut. The presence of blood and mucus macroscopically in the stool associated with tenesmus (painful rectal spasm) has been shown to only identify about 50% of the children who have shigellosis.[5]

It is of increasing concern that there is inaccurate diagnosis inappropriate treatment and antibiotic resistance in shigellosis. The management, particularly of patients with bloody diarrhoea, is often incorrect and irrational.[6]

For the treatment of non-invasive diarrhoea, it has long been known that oral rehydration therapy

At the time of writing Surgeon Sub Lieutenant Price was a Medical Cadet at the University of Edinburgh Medical School.

and appropriate feeding during and after diarrhoea are the essential treatments Current antimicrobial recommendations by WHO for treatment of shigella are ampicillin co trimoxazole and nalidixic acid However because of widespread resistance the options for treatment are the more expensive drugs pivmecillinam newer quinolones and ceftriaxone[7]

There is increasing pressure on doctors to prescribe medicines for all cases of diarrhoea Over prescription of antibiotics creates problems of multi resistance Improving case management by appropriate treatment is the primary strategy for decreasing mortality in the developing world

Setting of the Study

The Shishu Children s Hospital in Dhaka Bangladesh has more than 300 beds and admits more than 14 thousand children each year Each ward has rows of rusty iron beds each with a tattered mattress which is partially covered by a plastic sheet Every bed is filled by a mother or grandmother squashed onto the tiny space with her poorly child and in many instances with cockroaches and other insects crawling over the bed frames The state of cleanliness and hygiene on the wards is not as it should be and cross infection is rife The doctors and nurses however do an outstanding job within the resources available They were all very kind and welcoming to me during my time in the hospital as were all the people of Bangladesh whom I met

Twenty percent of admissions to The Shishu Hospital present with diarrhoea This paper is a survey of 192 patients admitted with diarrhoea and their presenting symptoms thus examining the main clinical features that these practitioners use to differentiate between invasive and non invasive diarrhoea The study also explores the management decision and choice of antibiotic made by the doctors and the sources of information open to them regarding current bacterial antibiotic sensitivities

Aims

The aims of the study were to review the criteria for classifying diarrhoea patients into those with invasive disease and other groups and to examine the use of antibiotics in children with diarrhoea at the Shishu hospital in Dhaka

Methods

The study was conducted at the Shishu Children s Hospital Dhaka Bangladesh Subjects for the study were children who presented with diarrhoea to the hospital and were either outpatients or admitted as inpatients and child inpatients who developed diarrhoea while at the Shishu

Each child was weighed on admission and the weight for age calculated from a chart The children s presenting symptoms were ascertained from the history recorded from the parent Four five practitioners were asked a series of questions about the presenting signs and symptoms of each of the children and their management decisions They labelled the diarrhoeal case as either invasive or non invasive based on the history and a preliminary examination.

Results

Information from a total of 192 patients with diarrhoea was collected for the study 70 (36%) were inpatients and 122 (64%) outpatients Thirty four percent (66) of patients were diagnosed as

Table 1 Sex distribution of children with diarrhoea at Shishu Hospital Dhaka (Sept/Oct 19)
Percentages given by sex

	Inpatient % (Cases=70)	*Outpatient % (Cases= 122)*	*Total % (Cases=192)*
Males	54	65	61
Females	45	35	39

Table 2 Age distribut ons (%) of pat ents with invasive /non invasive diarrhoea by outpatient/ inpatie t
Percentages in age groups

	Patient Type (Cases)	*Age group (yrs)*				
		<1/2	*1/2–1*	*1–5*	*5–10*	*>10*
Invasive	Out (45)	9	22	67	2	0
	In (21)	29	24	25	19	0
Non invas va	Out (77)	14	31	49	3	3
	In (49)	35	35	30	0	0

le 3 Percentages of malnourished children sented by weight for age of more or less than of the international mean standard

		Weight for age	
	Patient Type (Cases)	*<60%*	*>60%*
sive	Out (45)	24	76
	In (21)	43	57
-invasive	Out (77)	15	85
	In (48)	47	53

ng invasive diarrhoea and 66% (126) as non sive diarrhoea More males were brought to atients with diarrhoea than females There e however roughly equal numbers of male female inpatients *(Table 1)* The age ibutions are shown in *Table 2*

he nutritional status of children was indicated eight for age Malnourished children those weight for age less than 60% of the rnational mean standard, made up 30% of e with invasive diarrhoea compared with e of the cases of non invasive diarrhoea (See *le 3)*

resenting signs and symptoms which led itioners to differentiate between invasive and non invasive diarrhoea are shown in *Table 4* It is of note that in every instance where non invasive diarrhoea was diagnosed there was no history of blood in the stools However where invasive diarrhoea was diagnosed there was also no history of blood in the stools in 30% of cases

Only 60% (39) of 66 invasive diarrhoeas were treated with a shigella sensitive drug nalidixic acid pivmecillinam or ciprofloxacin As many as 85% (108) of 126 non invasive diarrhoeas were treated with antibiotics of some sort *(Table 5)* Oral Rehydration Salts was prescribed in 100% of diarrhoeal cases in outpatients It was hospital policy to administer intravenous fluids to all inpatients on admission with diarrhoea

Of the 45 practitioners 58% (26) said they would ideally prescribe pivmecillinam for invasive diarrhoea, 24% (11) said nalidixic acid *(Table 6)* Eighteen percent (8) chose an antibiotic which was not effective against shigella *(Table 6)* In cases of invasive diarrhoea a variety of reasons were given for the clinician's first choice antibiotic not being the one which was prescribed These included use of a cheaper drug uncertainty about the type of diarrhoea and awareness that nalidixic acid is unsuitable for young children

le 4. Percentages of children with diarrhoea diagnosed as (a) invasive and (b) non invasive presenting particular signs and symptoms

le 4(a) Invasive

	Inpatient (Cases=21)	*Outpatient (Cases=45)*	*Total (Cases=66)*
f	90	60	70
us	100	93	92
er	100	71	80
esmus	95	68	77
dominal pain	90	53	65
miting	57	24	35
dominal distension	48	9	21
lapse	19	9	12
dominal tenderness	48	18	27

le 4 (b) Non invasive

	Inpatient (Cases=49)	*Outpatient (Cases=77)*	*Total (Cases=126)*
d	0	0	0
ue	67	62	64
er	76	53	62
esmus	12	25	20
dominal pain	45	13	25
miting	61	32	44
dominal distension	14	12	13
lapse	2	1	2
dominal tenderness	2	6	3

Table 5 Percentages of (a) invasive and (b) non invasive cases prescribed antibiotics

Table 5(a) Invasive

	Inpatient (Cases=21)	*Outpatient (Cases=45)*	*Total (Cases=66)*
Nalidixic acid	19	43	34
Pivmecillinam	29	23	24
Ampicillin and Gentamicin	14	0	5
Cloxacillin	10	0	3
Ampicillin	29	2	11
Ceftriaxone	5	0	
Co-trimoxazole	0	4	3
Metronidazole	0	4	3
Cephalexin	0	2	2
Co-trimoxazole and Metronidazole	0	2	2
Co-trimoxazole and Erythromycin	0	2	2
Antihelminthics	0	2	2
Ceftriaxone	0	2	2
None	0	4	3
None (for admission)		2	2

Table 5(b) Non invasive

	Inpatient (Cases=49)	*Outpatient (Cases=77)*	*Total (Cases=126)*
Nalidixic acid	0	4	2
Co trimoxazole	4	41	26
Ampicillin and Gentamicin	26	0	10
Metronidazole	4	31	21
Amoxycillin	4	1	3
Ampicillin	31	0	12
Penicillin	2	0	1
Amoxycillin and Penicillin	2	0	1
Ceftriaxone	2	0	1
Ampicillin and Erythromycin	4	0	2
Ampicillin and Metronidazole	2	0	1
Co trimoxazole and Metronidazole	0	4	2
Antihelminthics	0	1	1
None	12	8	10
None (for admission)	-	10	8

Table 6 Percentages of practitioners mentioning first choice antibiotic for invasive infections

	Inpatient (Practitioners=36)	*Outpatient (Practitioners=9)*	*Total (Practitioners=45)*
Nalidixic acid	19	45	24
Pivmecillinam	64	33	58
Co trimoxazole	6	11	8
Metronidazole	3	0	2
Ampicillin	8	11	7

Table 7 Shigella Resistance figures (CDDR)(8) 1995

	Shigella Dysentariae Type 1	*Shigella Flexneri*
Ampicillin	>95%	60%
Co-trimoxazole	>95%	45%
Nalidixic acid	>95%	5%
Pivmecillinam	10%	35%

Discussion

There are a number of limitations regarding this study Firstly the study involves relatively small numbers Also the classification of diarrhoea by the practitioners was based mainly on the parent's history as microbiological confirmation of shigellosis was not possible Finally the selection of subjects was biased in that they are patients rather than a cross section of the whole population

The larger number of males being brought up to outpatients is probably a reflection of the importance of males within Bangladesh's Islamic society However patients who were admitted are those who are probably more ill and include nearly equal numbers of males and females

This study is consistent with many previous studies with regards to age range of patients with diarrhoea[5] Eighty two percent of 66 invasive diarrhoeal cases and 96% of 126 non invasive cases occured in the under 5 age group Also of note is that the very young cases of invasive diarrhoea are more likely to be admitted illustrated by the fact that a larger proportion of inpatients than outpatients were under 6 months This is expected because mortality rates are highest for invasive diarrhoea in the very young

Nutritional assessment showed that the proportions of cases with weights for age below 60% is far higher among inpatients than outpatients Those admitted are likely to be more malnourished, will suffer complications and make slower recovery than the children who are better nourished There was not a large nutritional difference shown between invasive and non-invasive diarrhoeal cases This is not consistent with Black *et al*[6] who showed invasive diarrhoea to be responsible for growth faltering In fact prolonged diarrhoea quite often follows acute shigellosis and has been said to be more common in poorly nourished children[7]

It is impossible to determine the exact aetiology of bloody diarrhoea solely on the clinical features although shigella is the pathogen most frequently isolated from the stools of young children with non-invasive diarrhoea in developing countries[8] Economic and time constraints mean that initial management decisions rely on presenting signs and symptoms Blood would seem to have been the main determining feature in differentiating between invasive and non invasive diarrhoea However 30% of cases which were diagnosed as having invasive diarrhoea had no history of blood in the stool On further analysis of this significant proportion of cases tenesmus and abdominal pain were more prevalent than for non-invasive cases This suggests that these two presenting symptoms may influence the diagnosis of invasive diarrhoea in the absence of bloody motions

For the management of invasive diarrhoea guidelines include treatment and prevention of dehydration and prompt treatment with an oral antimicrobial effective against most local shigella strains Severely malnourished children with invasive diarrhoea should be admitted to hospital The antibiotics recommended by WHO in 1994 are ampicillin co-trimoxazole, nalidixic acid, pivmecillinam quinolones and ceftriaxone However resistance figures produced by International Centre for Diarrhoeal Research Bangladesh (ICDDR(B)) in 1995 for shigella are shown in *Table 7*. Shigella flexneri is the most commonly isolated strain in developing countries If after a few days the antibiotic treatment is not effective revaluation should be done and another antimicrobial is indicated Unfortunately time constraints prevented patient follow up and revaluation being included in the study

In 100% of 122 outpatient cases oral rehydration solution was prescribed and intravenous fluids were administered to all inpatient diarrhoeal cases Antibiotic presumption was available in many of the cases Eighteen combinations of drugs were used in a total of 192 patients Antibiotics were used for 97% of 66 invasive cases and 9% received an antiparasitic drug Although 78% received a drug recommended by WHO for shigella because of local resistance patterns probably only 57% received an effective antibiotic However the survey of practitioners knowledge showed that 82% of them mentioned an effective drug as their first choice in treatment of invasive diarrhoea Reasons for this discrepancy are probably economic constraints on the hospital The practitioners at the Shishu appeared to be better informed than those interviewed by Ronsmans *et al* in Dhaka and rural areas of Bangladesh[10]

The treatment of non-invasive diarrhoea emphasises oral rehydration solution and not antibiotics which leads to problems of resistance In this study however antibiotics were prescribed in 90% of 126 cases and in 23% the antimicrobial was antiparasitic Previous studies have shown that the irrational use of antibiotics is common in Bangladesh[7] and an extension of this study could have been to ask questions to determine the reasons for this Possibilities include prescribing pressure treatment of other concurrent infections and as a precaution in cases of uncertain pathology Among inpatients

antibiotics were sometimes given to prevent cross infection of shigellosis from other patients on the ward

Conclusions

Diagnosis between invasive dysenteric and non invasive watery diarrhoea in the children at the Shishu Hospital is mainly based on parental information about the presence or absence of blood in the stool. The report of abdominal pain and tenesmus were the only other criteria practitioners consistently used to diagnose invasive dysenteric diarrhoea. It is likely that a significant proportion of dysenteric patients were prescribed antibiotics that were inappropriate and probably ineffective according to ICDDR shigella sensitivity tests. The vast majority of non invasive diarrhoea patients were unnecessarily prescribed antibiotics by criteria recommended by WHO while the WHO recommendation of giving antibiotics only to children with bloody diarrhoea means that about 50% of cases of shigellosis will not receive appropriate treatment. This encourages practitioners to prescribe antibiotics for cases where there is no blood in the diarrhoea stools

Acknowledgements

I would like to thank a number of people without whom I could not have completed this study. Firstly the staff and patients of at the Shishu Hospital particularly the doctors who constantly gave me their time during the working day. I would also like to thank the Royal Medical Society and The Research Fund of Institute of Naval Medicine for the grants I was awarded for my travel to Bangladesh. Finally I would like to thank Dr Conor Doherty and Dr William Cutting for all their efforts and invaluable advice in helping me complete this study and Dr Roger Pethybridge help with analysis and presentation

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J Royal Naval Medical Service 1997 83 3 127–129

Case report: Avascular necrosis of the proximal tibia following upper tibial osteotomy

C E D Howell

Introduction

Upper tibial osteotomy is a well-recognised procedure for patients with osteoarthritis of the knee affecting the medial compartment. It was first described by Jackson in 1958 and since then many variations of the technique have been recorded. Follow up studies confirm relief of pain in up to seven and a half years in most patients and after 7 years in some early pain recurrence is associated with under-correction of a varus deformity.[1–3]

The osteotomy is made through cancellous bone which may be immobilised relatively easily with staples. Best results are obtained when performed in young patients with a short history of knee pain (less than five years) in whom there is true compartmental disease without subchondral collapse and good knee flexion. Published complications of this procedure are recorded in *Table 1*.

I report a case in which a wedge osteotomy proximal to the tibial tubercle[4] was employed and avascular necrosis of the proximal fragment developed. While mentioned in the literature[5,6] it appears to be a previously unreported complication.

Case Report

A 68 year old man who suffered from osteoarthritis of his left knee underwent an upper tibial osteotomy.[4] The wedge resection was fixed using three staples and the limb immobilised in a locked cast brace for three weeks during which weight bearing was encouraged and then mobilised for a further three weeks in the cast brace before supervised physiotherapy without external support was commenced. He initially made an uncomplicated post operative recovery but at review over a period of eight months the osteotomy failed to unite radiographically (*Figure 1*). He underwent an autogeneous bone graft to the osteotomy site but this failed to incorporate and the patient proceeded to total knee replacement. At this operation the tibia proximal to the osteotomy was clinically necrotic except for a small area at the insertion of the posterior cruciate ligament. Following its excision histological examination confirmed avascular necrosis (*Figure 2*). Following total knee replacement the patient made an excellent post operative recovery.

Table 1 Complications of Upper Tibial Wedge Osteotomies

Local Complications	
Peroneal Nerve Injury	3.3%[1] 11.9%[2]
Delayed Union	4%[3]
Non Union	3.3%[1]
Infection	11% Superficial 3% Deep[3]
Over or Under correction of the deformity	
Recurrence of the deformity	18% at nine years[3]
Fracture into the knee	1.5%[3]
Anterior Tibial Artery Injury	Secondary to external compression or internal stretching or kinking
Popliteal Artery Injury	1 case in 504 operations [5] 2 case reports 1 case report[10]
Avascular Necrosis [3]	
General Complications	
Deep venous Thrombosis	5%[3]
Pulmonary Embolism	1%[3]

Discussion

Avascular necrosis following osteotomy is a well recognised complication. It has been described at various sites from the metatarsal to the mandible and whilst mentioned in two articles in the

Surgeon Lieutenant Commander Howell is currently attached to the Princess Margaret Rose Hospital in Edinburgh for Higher Process and Training.



Figure 1 Radiograph

literature as a result of upper tibial osteotomy there appear to be no recorded cases.

Vascular complications are rare. There are only four reported incidents of direct popliteal artery damage[5,9,11]. Indirect damage to the anterior tibial artery due to stretching or narrowing as the tibial alignment is corrected may cause ischaemia of the peroneal nerve[1]. Direct trauma has also been recorded



Figure 2 Histological appearance of proximal tibia

The proximal tibia has both intra and extramedullary blood supply. It is thought probable that in this case the extramedullary supply was compromised at operation and the intramedullary supply was inadequate to maintain viability.

There is a high incidence of surgical complications following upper tibial osteotomy and this procedure should not be undertaken without informed consent detailing the complications. Whilst avascular necrosis of the proximal fragment of the osteotomy has been included to the various publications to my knowledge despite an extensive literature search no cases have been recorded.

Acknowledgment

I would like to thank Surgeon Captain Farquharson Roberts Consultant Orthopaedic Surgeon Royal Hospital Haslar for allowing me to present this case.

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ABSTRACTS

Howell M A, Guly H R A comparison of glucagon and glucose in prehospital hypoglycaemia *J Accid Emerg Med* 1997 **14** 30–32

Objective—To compare intramuscular glucagon with intravenous glucose in the prehospital management of hypoglycaemia in adults

Methods—In the first part of the trial all UK ambulance services were asked how their personnel treat prehospital episodes of hypoglycaemia. In the second part, two protocols for treating prehospital hypoglycaemia were studied. In phase 1 intramuscular glucagon 1 mg was used. In phase 2 intravenous glucose 25g was used if intravenous access was not possible intramuscular glucagon was given

Results—33 out of 43 respondent ambulance services (76.7%) only use glucagon for prehospital hypoglycaemia the remaining services use glucose and glucagon. In the second part of the study the median duration from diagnosis to full orientation (Glasgow coma score 15) was 25 minutes (95% confidence interval 18 to 49 minutes) in phase 1 and 11 minutes (95% confidence interval 8 to 19 minutes) in phase 2. This difference is statistically significant ($P<0.005$) On scene times were not significantly different

Conclusions—Intravenous glucose is the treatment of choice in prehospital hypoglycaemia but glucagon should also be available for intramuscular use when intravenous access is not possible

Sheard SC, Pethybridge RJ Wright JM, McMillan GHG Back Pain in Aircrew—An Initial Survey *Aviat Space Environ Med* 1996 **67** 474–477

Background In the early 1990s staff at a Royal Naval Air Station formed the view that pilots and observers of the Navy Lynx helicopter fleet appeared to have a higher incidence of back pain, to be seeking medical assistance more frequently and to be spending more time medically unfit to fly when compared to their counterparts in other helicopters

Hypothesis To quantify the incidence of low back pain in helicopter aircrew by use of a questionnaire

Methods A questionnaire was used to establish the prevalence and nature of back pain in Naval aircrew (161 compared to a control group of randomly selected non-flying military personnel (310)

Results Results show that aircrew (82%) experience significantly more back pain than controls (52%) ($P<0.01$) though the nature of pain was similar in both groups. Significantly more aircrew (73%) than controls (49%) ($P<0.01$) reported a previous history of back pain and report pain in shoulders (19%) midback (42%) lower back (72%) and across the buttocks (12%). Ergonomic factors were thought to be causative. Of aircrew surveyed 11 (8%) had been issued with personal lumbar supports which resulted in major subjective improvements in flight related symptoms

Conclusions Helicopter aircrew have a higher incidence of back pain. Crew station design was identified as a major contributor to the prevalence of back pain while personal supports reduced the levels of discomfort. While these findings are not new no significant steps have been taken to redesign the crew station. It is recommended that personal supports are provided to all aircrew and that a more detailed study of crew station ergonomics is indicated following a more comprehensive study of prevalence of back pain in Royal Navy aircrew

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Research

Is Testicular Cancer an Occupational Disease? A Case-Control Study of Royal Naval Personne

S J Ryder, P I Crawford, R J Pethybridge

Abstract

Testicular cancer is the commonest malignancy arising in men actively serving in the Royal Navy. This study which includes a literature review of the aetiology of the disease is designed to determine the relative risk of developing testicular cancer in various occupational groups within the Service by means of a Case-Control study. All cases of testicular cancer occurring in serving personnel between 1976 and June 1994 inclusive were identified. One hundred and ten cases were found. Four randomly selected controls were matched on the basis of date of birth and length of service to each case. Results reveal statistically significant increased Odds Ratios for members of the Fleet Air Arm (OR=1·90 95% CI 1·04–3·48). Air Engineers (OR=2·32 95% CI 1·20–4·48) and the Aircraft Handling sub specialty (OR=7·31 95% CI 1·81 29·53). It is speculated that exposure to glycol ethers in aviation fuel may be the causative mechanism. No associations were found in relation to ionising radiation exposures or length of time served in nuclear submarines.

Introduction

Testicular cancer is one of the more common tumours in young men and is the single commonest malignancy arising in men serving in the Royal Navy. Of particular concern is the fact that the incidence of this disease is increasing dramatically throughout the world wherever epidemiological data is available.[1] Testicular cancer is not generally considered to be an occupational disease. However the reasons for its increasing incidence are largely unknown and in search of an explanation recent attention has been turned to the examination of socioeconomic, environmental and occupational factors.[2] A review of the literature concerned with the aetiology of testicular cancer is given below as will be seen Royal Naval personnel are at risk in terms of age. In addition they are potentially exposed to many of the risk factors and also belong to some of the occupational groups with which an association has been made. They may therefore be at increased risk of developing the disease.

Aim

The aim of this study is to determine the relative risk of developing testicular cancer in several occupational sub groups within the Royal Navy by means of a Case Control study.

Incidence

Testicular cancer is a rare disease both in absolute terms and in comparison with other cancers. It accounts for 2 per cent of male cancers and about 60 per cent of these occur in men aged between 20 and 44 years. It constitutes the fourth most common genitourinary tumour.[3–5] In England and Wales during 1987 it was the commonest tumour diagnosed in men aged 15–44 years accounting for 16% of all malignant cancers in males.[6]

Analyses of time trends in mortality from testicular cancer in England and Wales[7,8] and elsewhere[9,10] have shown a consistent increase from the beginning of this century until the early 1970s with the increase being particularly marked in young adults. In a detailed study of time trends in the incidence of testicular cancer Forman and Moller[11] calculated rates from data supplied by 11 cancer registries that had reported data to Cancer Incidence in Five Continents since at least 1970. An increasing trend in incidence was seen in almost all populations. This was true both for populations whose rate was high as in

Surgeon Commander Ryder is currently on an exchange appointment in the USA. Surgeon Commander Crawford is Principal Medical Officer HMS *Dolphin* and Dr R J Pethybridge is Head Statistician at the Institute of Naval Medicine

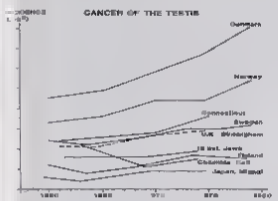


Figure 1 Trends in the Age-adjusted (World Standard Population) Incidence Rates of Testis Cancer in Selected Countries

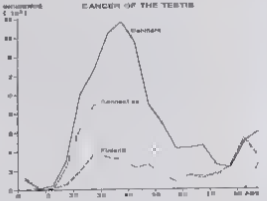


Figure 2 Age specific incidence rates of testis cancer in Denmark (1973 to 1976 (high risk area) Connecticut (1973–1977 (moderate risk area)—and Finland (1971 to 1976 (low risk area)

Denmark and New Zealand Maoris where they exceeded 10 per 100 000 in 1985 or low as in Bombay Japan and Detroit blacks where they were less than two per 100 000 in 1985 There was remarkable consistency in the increase and it was seen in several populations It was evident over the entire time period for which data were available These figures indicate that the incidence of testicular cancer is doubling approximately every 37 years overall and every 29 years in European populations *Figure 1* reproduced from Tollerman and Roth [17] demonstrates that the steady increase in the incidence of the disease is occurring in most parts of the world

In comparison to incidence rates mortality rates for the disease have been falling (4–7% per annum) in Denmark, Finland, England and Wales, New Zealand and the USA This almost certainly reflects the increasing availability of effective chemotherapy for teratoma over this period Higher mortality rates were seen in eastern Europe which in more recent years are falling again probably due to improved chemotherapy

Age Distribution

Unlike most other solid tumours the incidence rate for testicular cancer does not increase as a function of age but reaches a maximum at about 30–34 years and then declines to become uncommon in men over the age of 55 years [1] This unique distribution reflects the variation in the incidence of different histological types Yolk sac tumours and mature teratomas occur in young children while seminoma and various other types of malignant germ cell tumours predominate in adults In older persons most of the tumours are lymphomas or sarcomas *Figure 2* reproduced from Tollerman and Roth [1] compares the age specific incidence rates of testicular cancer in high risk (Denmark) moderate risk (Connecticut) and low risk (Finland) areas

Aetiological Associations

Many risk factors have been proposed for the aetiology of testicular cancer Only a history of undescended testis and infantile inguinal hernia have been established with any certainty [13] Reported aetiological associations with testicular cancer are discussed below

a *Congenital Abnormalities*—Cryptorchidism is the major established risk factor for testicular cancer [4–15] Relative risks of the order of 2–6 are consistently found Incidences of unilateral trial descent, the descended testis is also at increased risk of becoming cancerous [19] They also found an increased risk of adult testicular cancer in men who had ever had an inguinal hernia of about 1 6 which was compatible with other studies

b *Genetic*—there are several reports on the occurrence of testicular cancer in twins and in both father and son [20–2] Frequently the tumours have been histologically identical These studies and others showing testicular cancer to be rare in certain ethnic groups suggest that genetic factors play a role in the development of the disease Against this it is possible that the cases of cancer in twins were selectively reported and ethnic variations may reflect environmental differences

c. *Hormonal*—The United Kingdom Testicular Cancer Study Group (UKTCSG)[9] looked at three variables associated with age at puberty i e age at starting shaving age at voice breaking and age at first having nocturnal emissions. These were all significantly related inversely to the risk of testicular cancer. Moss *et al*[7] had previously reported a twofold increased risk in men who underwent puberty (as assessed by reported age at appearance of pubic hair) at ages less than 14 years. Swerdlow *et al*[22] asked directly about age of puberty and its timing in relation to other classmates and found no relationship to risk. Infertility as a risk factor has also been looked at in some detail of course excluding subjects with bilateral undescended testes all of whom are likely to be infertile or subfertile. Men with infertility are known to have an increased prevalence of testicular carcinoma in situ[5, 6] and it has been suggested that cancer and subfertility are both associated with a common underlying defect in spermatogenesis.[7] However the UKTCSG[9] found only a weak association with low fertility (1·7%) in support of this theory. Environmental oestrogens and their postulated role in explaining the observed decreases in sperm counts and motility which appear to have occurred over recent years have become a topical subject recently. Hard evidence in man is scarce[8] but there is evidence from wildlife studies that environmental oestrogens may be producing feminising effects in fish and birds and therefore it is speculated could increase the incidence of male infertility and testicular cancer in man.

d. *Testicular Trauma, Orchitis and other Medical Factors*—There has been considerable debate as to the relevance of testicular trauma to tumour development. The UKTCSG[9] analysed the time between injury and diagnosis/pseudodiagnosis (i e the date on which the control was exactly the same age as his matched case was at diagnosis) and demonstrated that substantially more of the injuries reported within two years of diagnosis occurred in cases than controls [OR=7·46]. Why should this be? Trauma may have a late effect by increasing trauma related mitotic activity in an already damaged cell. Alternative explanations are that cases selectively recall more episodes of trauma than controls in the period leading to diagnosis or that the injury led directly to the discovery of the tumour or finally that trauma accelerated the growth of a tumour.[29] The UKTCSG certainly found some evidence of recall bias in their study. Other studies have shown consistent associations with trauma.[7, 30, 31] Sporting activities have also been thought to be important. Coldman[32] and Haughey[33] found raised relative risks associated with cycling and horse riding. Haughey also found slightly raised risk associated with contact sports and Coldman with playing soccer. These findings were not confirmed by the UKTCSG which found a protective effect associated with sports and an inverse relationship between development of testicular cancer and total hours of exercise.[9] Raised relative risks have been noted in association with a history of orchitis[7, 12, 33] but they were based on small numbers. Post pubertal mumps is a common cause of orchitis but the UKTCSG found no relationship with mumps. Testicular atrophy appears to be an important precursor of cancer. Sixteen per cent of Haughey's cases and 3·5% of Swerdlow's but only 0·5% of the UKTCSG cases reported testicular atrophy. The UKTCSG also found an association with a history of ever having a sexually transmitted disease (OR=2·22 95% CI 1·46–3·39) and Swerdlow[7] one with a history of atopy i e of asthma hay fever or eczema (RR=1·8 P>0·05).

Environmental and Occupational Associations

Socioeconomic Status—One of the most consistent features of testicular cancer in comparison to other solid tumours is the finding, in almost all studies of an association with high socioeconomic status.[34, 35, 36, 39] Correspondingly risk has been found to be raised in professional managerial and administrative occupations[2, 34, 35, 39] and is also related to educational attainment. No reasonable explanation has been given for this other than to relate the finding to indoor and sedentary employment.

Environmental Temperature—The extra-abdominal position of the testes makes them vulnerable to the effect of variation of environmental temperature. Clemmesen[40] suggested that variation in temperature may be in some way

olved in temporal and geographic differences
testicular neoplasms Results from
demiological studies linking increased scrotal
nperature and testicular cancer conflict Liu
d Kessler[4] and Longhlin[5] reported that the
aring of jockey type underpants increased the
k of testicular cancer However Brown[43]
Hughey[44] and Karrigas[45] found no such
sociation Adverse temperature effects may
count for the increased cancer risk of the
descended testis but not of the contralateral
cended testis

Ionising and Non Ionising Radiation The
idence is inconclusive The committee on the
Biological Effects of Ionizing Radiation state in
BIR V[46] that relatively little information is
ailable on the possible association between
izing radiation and testicular cancer
icularly with reference to potential human
ks, however some animal studies have shown an
sociation[46] Mortality from testicular cancer
s raised by 50 per cent (SMR 153) but this was
t significant statistically in a large cohort of
ited Kingdom atomic energy workers[47]
ardlow *et al*[48] demonstrated raised risk (approx
%) in relation to reported exposure to ionising
diation although again this was not statistically
nificant They also reported that military
posures are associated with a raised risk
R=2 93 95% CI 0 78–10 94) but there was no
sed risk for civil or research exposures No
planation was given for this other than that the
litary exposures may be larger but no exposure
ta were available Little is knowu about non
using radiation exposures and the risk of
icular cancer A cluster of six cases (O/E 6 9
0 001) among a cohort of 340 police officers
s recently reported[49] The only shared risk
lor was the use of hand held radar used in close
oximity to the testes

Occupation—Several occupations have been
associated with an increased risk of testicular
ncer and are discussed below

a *Farmers and Allied Workers*—Lupworth[50] reported an excess of seminoma (30% p<0 01) in men living in rural as opposed to city areas Work in farming has been associated with increased risk in some[51–54] but not all studies[55–57] Van den Eeden *et al*[56] found a weak statistical association with farmers and farm managers but not with farm workers Pesticides and sex hormones in cattle feed have been suggested as potential causative agents

b *Chiropodists*—In a study from the University of Pennsylvania College of Podiatry[58] of 1225 males enrolled 999 of whom responded by questionnaire four patients with testicular cancer were found The standardised morbidity ratio was estimated to range between 6 5 and 16 7 which were calculated using a variable allowance for lag period They proposed that because the college was housed in a new building this small cluster could be as a result of exposure to a building material or to an agent peculiar to podiatry

c *Workers in the Oil and Natural Gas Extraction Industry*—In a hospital based case control study from Texas Mills *et al*[5] noted an association with workers in the oil and natural gas extraction industries The study was based on a total of 347 cases 20 of whom worked in the oil industry They calculated an odds raue of 2 29 with a 95%CI 1 03–5 11

d *Workers with Brominated Chemicals*—In a historical prospective mortality study of 3579 workers in the chemical industry who were potentially exposed to brominated chemicals Wong *et al*[59] reported two deaths from testicular cancer when only 0 11 were expected Whilst the statistical variability is large the calculated SMR was 1799 p<0 05 Both men were employed at the same time and based on work histories methyl bromide was the only common potential exposure

e *Leather Tanners*—Levin *et al*[61] described a small cluster of cases of testicular cancer three cases in New York leather tanners They linked the cases to exposure to Dimethylformamide (DMF) which has been shown to cause testicular damage in laboratory animals[62–63] DMF has also been linked with testicular cancer in the aircraft manufacturing industry Gollus[64] pointed out that the leather tanners are exposed to other known carcinogens in their work such as azo-dyes

f *Painters*—Five cases of testicular cancer when only 1 6 were expected were reported

in a study of Vietnam veterans. Several previous studies had reported this association and the authors believed it probably to be a chance finding.

g *Aircraft Repairmen*—Ducatman *et al*[6] reported a cluster of testicular germ cell tumours (three cases) among 153 men who worked in a shop engaged in repair of exterior surfaces and electrical components of the airframes of the F4 Phantom military jet aircraft. Garland *et al*[67] in a study of US Navy personnel discussed in further detail below, showed that naval aviation support equipment technicians had a significantly elevated standardized incidence ratio for testicular cancer when compared with both civilian automobile mechanics. More recently, a study conducted in the RAF[68] reported an increased incidence of testicular cancer in RAF personnel when compared to age adjusted national rates (overall RR=3·27 95% CI 2·43–4·31). They also commented that the risk was highest in those working directly with aircraft but no causative agents were identified or proposed.

h *Naval Mechanics*—The large study conducted by Garland *et al*[8] of active duty US naval personnel looked at 2 275 829 person years between 1974–1979 with 143 cases. Incidence rates for testicular cancer were calculated and compared with the National Cancer Institute Surveillance Epidemiology and End Results (SEER) incidence and mortality data. Age adjusted incidence rates of testicular cancer in naval personnel as a whole did not differ significantly from the SEER population. However two occupational groups with duties similar to those of the civilian occupation of motor mechanic had significantly raised incidence rates for testicular cancer than those of the SEER population (SIR=3·4 95% CI 1·9–5·6) and the total Navy (SIR=3·8 95% CI 2·1–6·3). These were naval aviation support equipment technicians discussed above and enginemen. A third group construction mechanics, had an elevated standardised incidence rate which was not statistically significant. They believed that exposure to fuels, lubricants, paints and degreasing agents may be the cause.

i *Vietnam Veterans*—Vietnam service was associated with a statistically significant elevated risk of testicular cancer of greater than two in a case control study which among other things looked at a history of military service[69]. Risk was elevated in Army Navy and Air Force but not in those who served in the Marine corps. Exposure to the herbicide agent orange which was used in large quantities in this conflict was proposed as a potential cause[69]. A more recent study of 120 000 Vietnam veterans used surrogate measures of exposure to agent orange such as whether the subject was a ground troop or not, whether they were combat troops or not and the geographical regions in which they served. Interestingly only service in the Navy was associated with a statistically increased risk of testicular cancer a group whose exposure to agent orange was minimal other than those who served on inland waterway patrol boats.

j *Parental Occupation*—In a case-control study of 223 cases in the Washington DC area information was obtained on parental occupation[7]. For all histological types significant associations were found for specific occupations. However for cases with seminoma excess risk was observed for those whose parents were employed in the following occupations:

Mothers in health related occupations
OR=4·6 95% CI 1·1–19·1
Fathers working in car service stations
OR=4·0 95% CI 0·6–26·8
Manufacturing industries
OR=2·2 95% CI 1·0–4·8
Aircraft production and maintenance
OR=5·3 95% CI 0·7–210·1

In summary the aetiology of testicular cancer is complex and appears to involve several factors e.g. genetic, congenital and hormonal. However evidence suggests that environmental and occupational factors are probably also implicated. The reported association with naval engineering work, air mechanics and radiation exposure dictate the investigator to study these relationships further. This study is designed to determine if these associations can be confirmed in a Royal Naval population and to attempt to further clarify the relationship between work and testicular cancer.

Table 1 Classification of Germ Cell Tumours of Testis

WHO	British Testicular Tumour Panel
Seminoma typical spermatocytic	Seminoma classical spermatocytic
Embryonal carcinoma	Malignant teratoma undifferentiated
Embryonal carcinoma with teratoma [Teratocarcinoma]	Malignant teratoma intermediate
Teratoma mature	Malignant teratoma differentiated
Choriocarcinoma	Malignant teratoma trophoblastic
Yolk sac tumour	Yolk sac tumour

Method

Cases

In order to ensure that all cases of testicular cancer were identified cases were sought from two sources

a. The testicular tumour register held in the Department of Urology at the Royal Naval Hospital Haslar and its equivalent at Royal Naval Hospital Plymouth. Patients are required to be referred to a naval hospital for assessment of future fitness to serve even if treatment has been provided outside service resources. Records date from 1968.

b. Analysis of records held in the Defence Analytical Services Agency (DASA) at Bath which are classified by means of disease indicator codes. ICD code 186 was used. All significant illnesses (i.e. those requiring hospital admission or loss of time from work of greater than seven days) are recorded. Computerised records date from 1976.

The study includes all cases identified from either source from 1976 to June 1994. The diagnosis of testicular cancer was confirmed in all cases by scrutiny of histopathological evidence obtained from medical and hospital records. Histological categorisation was established according to the British Testicular Tumour Panel Classification (*Table 1*). This classification was simplified as shown in *Table 2* to expedite statistical analysis and to avoid inconsistencies in classification which were apparent particularly in the earlier cases. Additionally mixed tumours were also identified.

Any predisposing factors to testicular cancer e.g. a history of cryptorchidism were identified from the previous medical history given at the initial entry medical examination or from their hospital admission medical examination or discharge summary and recorded. A significant number of cases were identified in the DASA records which were not included in the Haslar register. Therefore, inclusion of Haslar cases diagnosed prior to 1976 would not have ensured that all cases were included. Commencement of the study from 1976 results in cases being sought from two independent sources. It is considered to be highly improbable that cases were missed using this method.

Controls

Controls were identified from computerised personnel records held at HMS *Centurion*. All servicemen are issued with a unique service number which is allocated sequentially at the time of recruitment. Four controls were matched to each case ensuring that a control could not also be a case using the following parameters:

a. **Date of birth** – within two years of the case to achieve age matching.

b. **Length of service** – to be at least as long as the case up until the time of diagnosis. This will eliminate controls who have left the service early and will therefore ensure that the control was at risk at the time that their matched case was diagnosed.

To minimise any errors which could arise from batching for example it is possible that servicemen may have been recruited in batch of engineers all possible controls who fulfilled the above criteria were listed for each case and those to be used were selected from the list using computerised random number generation.

Table 2 Simplified British Testicular Panel Classification of Testicular Tumours

British Testicular Tumour Panel	*Simplified Classification*
Seminoma classical spermatocytic	Seminoma
Malignant teratoma undifferentiated	Non – Seminoma
Malignant teratoma intermediate	Non Seminoma
Malignant teratoma differentiated	Non – Seminoma
Malignant teratoma trophoblastic	Non Seminoma
Yolk sac tumour	Non – Seminoma

Service histories for both cases and controls were obtained from the records held at Centurion. These provided information on units served with dates. Cases and controls were not allocated to branch or occupational speciality using a blinded technique but to eradicate observer bias the following unequivocal rules were applied

a *General Service*—Evidence of service in surface ships and appropriate shore establishments and by exclusion membership of the other branches

b *Submarine Service*—was defined as servi in a submarine for a minimum period of months

c *Royal Marines*—were recognised from th unique service number prefixes

d *Fleet Air Arm*—individuals were recogni from their occupational speciality co which for ratings is preceded by air a was otherwise clear for aircrew i e pilo observers etc.

Occupational history was also determined fr the service record. *Figure 3* is a diagram showi how rank branch speciality sub speciality related and this structure was used categorisation. If an in service change speciality occurred then the subject was allocat to the occupational speciality in which he h served for the majority of time. Subjects were a categorised as officer rating or SD SD category of officer who has previously served a rating.

The Defence Radiological Protection Serv (DRPS) records were examined to determine

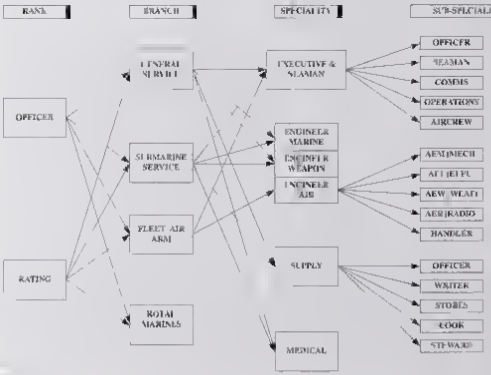


Figure 3 Branch Structure Used For Statistical Analysis

haiun record was held for each case and ntrol. The existence of a record was recorded e information provided by DRPS also identified ssified radiation workers. Annual and mulative dose burdens were recorded for cases l their matched controls up to the time of Lgnosis

Statistical methodology

e logistic model can be used to relate disease obabilities to one or more risk factors whose tors can be represented by indicator or ntinuous variables. The model relates a binary ponse variable y (ie y=1 or y=0) to exposure riable x via the equation

Probability (y=1 given x) = $\exp(\alpha+\beta x)/[1+\exp(\alpha+\beta x)]$

ere the coefficient β can be shown to represent relative risk[12]. The logistic model can be pted for case-control studies by deriving ditional probabilities. The parameters of the del are estimated by conditional maximum elihood[13]. For this study the statistical software LOGXACT (Cytel Software Corporation 1992, 93) has been employed

Results

One hundred and ten cases of testicular cancer re identified and four controls were matched each case in accordance with the criteria given ove. The age distribution for the cases is shown *Figure 4*. All except eight controls were within

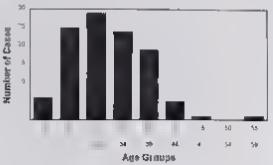


Figure 4 Testicular Cancer Cases: Age Distribution

the stated age matching criteria. In these, the criteria were extended a further 12 months to ensure the availability of an adequate number of controls. The breakdown of histological types is given in *Table 3*. In five cases (4.5%) histories of previous mal descent were obtained and two (1.8%) cases had histories of atrophic testis. These are summarised at *Table 4*. They were not removed from the study because in the relevant cases the mal descent had been surgically corrected and therefore the absolute risk of developing cancer from this predisposing factor was small and, as will be seen, atrophic testis can be a result of environmental factors. *Tables 5* to *8* summarise the numbers of cases and controls by Service Branch, Specialty, Sub Specialty, whether radiation records were held, if they were classified radiation workers and if they were officers or ratings. The small

Table 3 Breakdown of Histological Types

Specialty	Histological Classification (simplified)		
	Seminoma	*Non-Seminoma*	*Mixed*
Engineer (All)	7 (41%)	6 (35%)	4 (24%)
Cases	45 (44.5%)	45 (41%)	16 (14.5%)

Table 4. Cases with Histories of Risk Factors for Testicular Cancer

Case	*Branch*	*Specialty*	*Sub-spec*	*Risk Factor*
Rating	General Service	Engineer (W)		Bilateral Corrected Maldescent
Rating	General Service	Engineer (W)		Ipsilateral Corrected Maldescent
Rating	General Service	Supply	Steward	Contralateral Corrected Maldescent
Rating	Submariner	Engineer (M)		Ipsilateral Corrected Maldescent
Rating	General Service	Supply	Cook	Ipsilateral Corrected Maldescent
Officer	General Service	Supply	Officer	Testicular Atrophy
Rating	Fleet Air Arm	Engineer (A)	Mechanical	Testicular Atrophy

Table 5 Numbers of Cases and Controls by Service Branch

Branch	*Cases*	*Controls*
General Service	61	275
Submariner	20	70
Fleet Air Arm	19	45
Royal Marines	10	49
All	110	440

Table 6 Numbers of Cases and Controls by Service Specialty

Specialty	*Cases*	*Controls*
Supply	13	55
Engineer Air	17	34
Engineer Mechanical	21	51
Engineer Weapons	14	66
Seaman	25	140
Medical	4	5
Royal Marines	10	49
All	110	440

Table 7 Numbers of Cases and Controls by Service Sub-Specialty

Sub-specialty	*Cases*	*Controls*
Seaman		
Seaman	5	28
Communicator	2	25
Aircrew	2	11
Operations	8	53
Officer	8	17
Supply		
Writer	2	8
Stores	6	10
Cook	5	18
Steward	4	15
Officer	1	5
Engineer Marine	21	51
Engineer Weapons	14	66
Engineer Air		
Mechanical	4	15
Electrical	2	6
Weapons	1	3
Radio	4	6
Handler	6	4
Medical	4	5
Royal Marines	10	49
All	110	440

Table 8 Numbers of Cases and Controls by Other Groupings

Group	*Cases*	*Controls*
Officers	15	40
Ratings	95	400
Radiation Record?		
Yes	14	57
No	95	383
Classified Radiation Worker		
Yes	4	21
No	106	419

Table 9 Indicator Values Assigned to Servi Branches

Branch	*X(GS)*	*X(Sub)*	*X(FAA)*	*X(R*
General Service (GS)	1	0	0	0
Submariner (Sub)	0	1	0	0
Fleet Air Arm (FAA)	0	0	1	0
Royal Marine (RM)	0	0	0	1

number of SD officers precluded separ analysis and they were classified as ratin because all had spent the majority of their servi time as ratings

Analysis of Service Branches

The initial analyses involving the logis regression model used sets of indicator valu (yes=1 no=0) for the Service Branches Specialties etc For example *Table 9* illustra the values of those of the indicator (x s) assign to Service Branches

The coefficients (β s) associated with the nc zero indicator values were estimated conditional maximum likelihood estimatic The Royal Marines branch was used as reference group because it is the least compl group in terms of specialties and subspecialti The odds ratios of the other Branches relative the Royal Marines are given by the expressi $\exp(\beta)$ and it is these estimated values with th 95% confidence intervals that are shown *Table 10*

The likelihood ratio statistic indicates that the of odd ratios are not significantly different fr unity and the confidence intervals for individ odd ratios indicate raised values (i.e. greater t unity) (for the branches relative to the Ro Marines The following analysis looked at e branch relative to all other branches in the stu *(Table 11)* In summary Fleet Air Arm (FA (relative to all other branches) has a significan raised odds ratio (OR=1 90 95% CI 1 04–3 4 The other branches have either an OR below one the 95% CI includes unity as in the case submariners and there are therefore no statistica significant differences between these groups a the remainder combined Of the 19 cases belongi to the Fleet Air Arm eight had seminomas six n seminomas and five had mixed tumours

Analysis of Service Specialties

Similar analyses were conducted on the d when service specialties were considered Of Air Engineers had a statistically signific

...le 10 Odds Ratios of Service Branches Relative to Royal Marines

...nch	Odds Ratio with 95% Confidence Interval		
...val Service	1 08	0 51	2 28
...marines	1 40	0 80	3 27
...t Air Arm	2 14	0 58	5 20

...tnotes.
...rmative strata (1 case and 4 controls per stratum) = 100
...of Observations=500
...elihood ratio statistic=5 01 for 3 degrees of freedom

...le 11 Odds Ratios of Service Branches Relative to the Other Branches Combined

...nch	Odds Ratios with 95% C I			Strata	L R S
...val Service	0 73	0 47	1 12	97	2 04
...marines	1 12	0 68	2 08	61	0 34
...t Air Arm	1 90	1 04	3 46	47	4 11
...al Marines	0 73	0 38	1 84	47	0 41

...tnotes
...is the confidence interval
St...ata is the number of informative strata (1 case & 4 controls per stratum)
L...S is the likelihood ratio statistic with 1 degree of freedom

...le 12. Odds Ratios of Service Specialties Relative to Royal Marines

...ciality	Odds Ratio with 95% Confidence Interval		
...pply	1 77	0 74	4 23
...neer Air	2 81	1 03	8 62
...neer Mechanical	1 12	0 48	2 63
...neer Weapons	1 04	0 43	2 48
...man	0 86	0 39	2 01
...ical	3.91	0 86	17 32

...tnotes
...rmative strata (1 case & 4 controls per stratum) = 110
...of Observations=550
...elihood ratio statistic = 12 59 for 6 degrees of freedom

...le 13 Odds Ratios of Service Specialties Relative to the Other Specialties Combined

...ciality	Odds Ratio with 95 % C I			Strata	L R S
...pply	1 48	0 83	2.58	98	1 64
...neer Air	2 32	1 20	4 48	38	5 94
...neer Mechanical	0 80	0 53	1.54	74	0 14
...neer Weapons	0 83	0 45	1.53	90	0 37
...man	0 63	0 36	1 03	85	3 63
...ical	3.20	0 86	11 92	8	2 74
...al Marines	0 73	0 38	1 84	47	0 41

...tnotes:
...is the confidence interval
St...ata is the number of informative strata (1 case & 4 controls per stratum)
L...S is the likelihood ratio statistic with 1 degree of freedom

[illegible] Royal Marines (*Table 12*). The supplementary analyses of individual specialities relative to all other specialities combined also indicated a significantly raised OR only for the Engineer Air Specialty [OR=2 32 95% CI 1 20–4 48) (*Table 14*) Of the 17 cases who were Air Engineers seven had seminomas six non seminomas and four had mixed tumours

Analysis of Service Sub-Specialities

This study included small numbers of cases and controls from various sub specialities in the Seaman Supply and Engineer Air Specialities (*Table 7*) Analysis reveals that only the Aircraft Handling sub specialty (six cases) had a significantly raised OR (OR=8 89 95% CI 1 83–43 13) relative to Royal Marines (*Table 14*) and also relative to all other individuals (OR=7 31 95% CI 1 81 29 53) considered (*Table 15*) Of the six cases who were Aircraft Handlers two had seminomas one a non seminoma and three had mixed tumours

Analysis of Other Groups

Table 16 summarises analyses of other groups, i e all officers submariners those service personnel for whom radiation records are held and classified radiation workers The odds ratios relate to the analyses of each of these groups (in turn) relative to all other individuals in the study The 95% confidence intervals of these odds ratios overlap unity and there is insufficient evidence to suggest high or low relative risks for testicular cancer within these groups Of those personnel for whom radiation records were held at any time up to the point of diagnosis for the case or its matched controls the mean radiation cumulative dose for cases was 0 44mSv (range 0–20 10mSv) and for controls 0 65mSv (range 0–38 92mSv) In order to determine if the risk of developing testicular cancer increased with the magnitude of cumulative dose a separate logistic regression analysis (based on matched sets) using cumulative dose as a covariate was conducted The regression coefficient β had value –0 027 (standard error 0 042) i e a non significant value This study does not provide evidence to indicate a radiation dose response relationship for testicular cancer Similar logistic regression analyses were conducted using total time appointed to all classes of operational submarine and total time appointed to nuclear submarines as covariates For total time in all classes of submarine the regression coefficient had a value of –0 0051 (standard error 0 0033) and for time in nuclear submarines it –0 0065 (standard error 0 0039) This st therefore does not provide evidence to indicate exposure time response relationship for testicu cancer either for total time served in all classe submarine or for total time served in nucl submarine In addition there were no statistic significant differences between the odds ratios Submarine Engineers (M) and (W) either betwe engineers as a whole or a group containing other cases and controls in the study

Discussion

A case control study was undertaken The reas for the choice of this type of study design opposed to a cohort study based on determination of incidence were as follows

a. Comparison with published data of incidence of cancer in the gen population e g the National Can Registry is known to be unreliable [7] Wh it may have been possible to cond internal comparisons the dynamic natur service careers (ie relatively short times spent in appointments between ships b ashore and afloat) results in great difficu defining the at risk population and therel calculating incidence rates

b It is more efficient.

Controls were selected using two criteria i e dat birth and length of service These were cho because recruits generally join the Navy at about same age (i e 18–20 years) and they would ens that the controls were in service at the time that th matched case was diagnosed It is possible that method may have reduced the potential differences in exposure between cases and cont and thereby reduced statistical power The majority of controls were selected from gro whose size was of the order of 100 to several h potential candidates who met the matching crite and which included the full range of exposur i e branch speciality and sub specia alternatives It is therefore believed that reduction in statistical power would not h been large

By its nature this study is exploratory in ty Apart from ionising radiation (for which reli exposure records exist) it does not attempt to exposure to physical or chemical agents but determine if the relative risk of developing disease is the same across all branches specialisations within the Navy The strength

s study is based on the quality of Service ger and medical records which enable the ntification of all cases of testicular cancer and accurate account to be made of an individual rviceman's employment. Its main weakness is it the study only includes cases diagnosed in Service. This is ameliorated to some extent by the fact that contrary to most other solid tumours the peak age of incidence of testicular cancer occurs at an age when many men continue to serve and is falling steeply at the age when they retire. It must also be borne in mind that the Naval population is

ble 14. Odds Ratios of Service Sub-specialties Relative to Royal Marines

b-speciality	*Odds Ratio with 95% Confidence Interval*		
sman			
seaman	0 67	0 27	2 63
ommunicator	0 40	0 06	1 56
Aircrew	1 07	0 18	5 84
Operations	0 70	0 25	1 84
Officer	2 59	0 68	10 16
pply			
Writer	1 38	0 25	7 74
stores	3.62	0 99	12 44
Cook	1 73	0 54	6 45
Steward	1 44	0 37	6 57
Officer	1 01	0 10	9.31
gineer Marine	1 15	0 49	2.73
gineer Weapons	1 13	0 47	2 73
g neer Air			
Mechanical	1 78	0 46	6 83
lectrical	1 63	0 25	11.32
Weapons	2 15	0 19	23 77
Radio	3 82	0.84	17 31
Handler	8 89	1.83	43 13
dical	4 13	0 81	18.83

tes
rmative strata (1 case & 4 controls per stratum) 110
of Observations 550
elihood ratio statistic = 27 5 for 18 degrees of freedom

Table 15. Odds Ratios of Service Sub-specialties Relative to All Other Sub-specialties (and Specialties) Combined

b-speciality	*Odds Ratio with 95% C I*		*Strata*	*L R S*
sman				
Officer	2.28	0 86	18	2 56
g neer Air				
Handler	7 31	1 81	9	8 25

tes:
is the confidence interval
ata is the number of informative strata (1 case & 4 controls per stratum)
S. is the likelihood ratio statistic with 1 degree of freedom

Table 16. Odds Ratios of Other Groups Relative to a Group Containing All Other Cases and Controls

oup	*Odds Ratio with 95% C.I*		*Strata*	*L R S*
Other	1 92	0 87	3 50	34	2 48
Seamanship	1 18	0 65	2 06	61	0 34
Ribbon Record Held	0 95	0 62	1 59	93	0 01
ssified Radiation Worker	0 75	0 26	2 22	25	0 26

tes:
is the confidence interval
ta is the number of informative strata (1 case & 4 controls per stratum)
S is the likelihood ratio statistic with 1 degree of freedom

highly selected [illegible] of educational physical and medical standards and a powerful healthy worker effect may be invoked This may exert its influence in several ways

a The educational standards for entry may tend to increase the incidence of the disease in the Naval population because of the known association of testicular cancer with educational attainment and socioeconomic status [2 37 82–84] However this association may reflect a sedentary lifestyle rather than these factors *per se*

b The high medical standards required for entry particularly as uncorrected undescended testis is a stated reason for rejection should reduce the incidence of the disease in a Naval population when compared to a general one

c The requirements to maintain high standards of physical fitness throughout a Service career may confer a degree of protection from the disease.[40] Because the study uses other Servicemen as controls these effects will be nullified but they do impair extrapolation of the results to a general population

This study again confirms the known association previously discussed, of testicular cancer with aviation related occupations (Odds ratio (OR) for Fleet Air Arm=1 90 95% CI 1 04–3 48) This association appears to be linked to Air Engineers (OR=2 32 95% CI 1 20–4 8) but not to Aircrew (OR=1 07 95% CI 0 19–5 94 relative to Royal Marines) Further analysis of the subspecialties of the Air Engineering specialty reveals a statistically significant association only with Aircraft Handlers (OR=7 31 95% CI 1 81 29 53) No association is apparent with non Air Engineers either Marine or Weapon Why should this be so? – Particularly as superficially air engineering work is generally regarded as being much cleaner than work on ships propulsion systems which it might be assumed would lead to a greater exposure to hydrocarbon carcinogens One obvious difference is that work with aircraft may expose personnel to aviation fuel Aviation fuel is a complex mixture of aliphatic and aromatic hydrocarbons with physical and chemical properties similar to commercial petrol Exposure via inhalation to jet fuel has been studied in animals [74 75] These studies reported treatment related renal toxicity and neoplasia but they did not demonstrate the occurrence of tumours in other organs which could be extrapolated to other species However Bruner *et al* [74] did report that the incidence of testicular atrophy (of the seminiferous tubules) was distributed in a treatment related manner and that testicular changes were slightly more prevalent in treated males examined in the 12 month post exposure period Exposure to similar fuels is almost certainly experienced throughout the Navy (gas turbine fuel is almost identical) and it is unlikely that exposure to basic aviation fuel explains the apparent excess of testicular cancer in Air Engineers One further important difference between aviation fuel and other fuels is the addition of glycol ethers as an antifreeze, at a concentration of 0 15% at which point it is known as AVCAT Glycol ethers are a widely used group of chemicals which in their simplest form are the monoalkyl ethers of ethylene glycol of general formula



The simplest of the glycol ethers is 2 methoxyethanol (MEL=5ppm) and its ability to cause severe degenerative changes in the germinal epithelium of the seminiferous tubules in laboratory animals has been well established These changes which lead to testicular atrophy have been observed in animals exposed both orally and by inhalation 2-ethoxyethanol has also been shown to produce slight degenerative changes to the testis but it appears to be less toxic in this respect These chemicals can also be absorbed via the skin There is little evidence of testicular toxicity in man but a cross sectional study of employees of a chemical plant in the USA who were exposed to 2 methoxyethnnol vapour at a time weighted average concentration ranging between 0 42 and 8.5ppm and air levels up to 20ppm has been reported.[77] Only six exposed and nine control workers participated in the examination of testis size, semen abnormalities and serum hormone levels There was a tendency towards increased sperm counts and increased serum follicle stimulating hormone levels (FSH) with increasing exposure but the small size of the study prevented meaningful interpretation of the findings Decreased testicular width was noted among exposed workers However they reported that the measurements may have been influenced by observer bias Testicular cancer has not been reported from either animal or human studies to be associated with exposure to glycol ethers

mechanism by which chemically induced testicular cancer could lead to cancer may exist. Ivey and Mead[78] stated that testicular atrophy th increased gonadotropin (particularly FSH) ive is now increasingly regarded as the final mmon pathway for several well established k factors e g cryptorchidism and trauma They o proposed that any environmental factors olved in the causation of testis cancer might n act in this way and that their argument is engthened by the study of Carlsen *et al*[79] *itter a* that has reported changes in sperm counts of normal population over the past 50 years. cause this trend has coincided with a markedly creased incidence of testicular cancer Carlsen d have speculated that there might be a common vironmental factor involved in both the decline sperm counts and the development of testicular ncer If this is true and glycol ether exposure is cause of the observed increased relative risk of testicular cancer in this study then it should be ssible to detect decreased sperm quality in Air gineers relative to other Service or external ntrols

If exposure to glycol ethers in AVCAT were to the mechanism by which work in an gineering gives rise to an increased risk of testicular cancer then a route of exposure most st 2 methoxyethanol (ethylene glycol nomethyl ether—EGME) was used as an ditive in AVCAT until recently when it was laced with the assumed to-be safer 2 (2-thoxyethoxy)ethanol (diethylene glycol nomethyl ether—DEGME) The glycol ether dded to the fuel prior to its distribution to units el is transferred to aircraft by means of a sealed tem with a mechanical connection and postures at the time of delivery are likely to be minal However spillages are not unusual ty significant spillages have been formally ported since 1988 and it is assumed that smaller llages occur unreported It is interesting to note t Aircraft Handlers are charged with the ponsibility of dealing with fuel spillages Fuel nks are frequently drained to remove water ich has collected in the bottom of the tank cause the glycol ether is more soluble in water an in fuel this drained water has been found to ntain much higher concentrations of the ether than in the fuel and thus may give rise to additional exposure route

Chromium and cadmium have been shown to se testicular cancer in laboratory animals rally by injection into the testis or subaneously[80–8] Chromium and cadmium plated components are found on Naval aircraft but potential exposure routes are different to civilian Several large cohort studies of workers occupationally exposed to these metals[85 86] have been conducted and no association has been demonstrated with testicular cancer

It is evident that further study of an engineering work practices and exposures is required to determine the cause of this observed increased relative risk of testicular cancer

In terms of the effectiveness of the control measures by which the safety of the submarine atmosphere is achieved this study is reassuring in that no increased risk of developing testicular cancer is observed in submariners and this remains true when length of service and time on nuclear submarines is considered Although the number of exposed individuals is not large and radiation doses are relatively small this study does not demonstrate an association between testicular cancer and holders of a radiation record, classified radiation workers or the magnitude of cumulative dose

Summary

In summary this study demonstrates a statistically significant increased relative risk of testicular cancer in association with work on aircraft This increased relative risk is confined to Air Engineers and not to Aircrew and is highest in the Aircraft Handling sub specialty It is speculated that this association may be due to exposure to glycol ethers in aviation fuel Further study is required to determine the causal factors which should include a detailed occupational hygiene survey of the work of air engineers and a study of their testicular function

Conclusion

Testicular cancer is a multifactorial disease with genetic, congenital and hormonal factors included in its causation There is some evidence that occupational and environmental factors may also be involved

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Erratum

An audit of cholesterol measurement in patients with ischaemic heart disease in a District hospital *J Roy Med Sta* 1997 **83**(2) 85

In the paragraph beginning All patients the second sentence should read *Patients with coronary heart disease and serum cholesterol >5 5mmol/l should be treated*

Royal Naval Medical Service 1997 83.3 147 156

History

Cholera and the Royal Navy 1817–1867

I H Taylor

paper based on the author s contribution of the same title in New Researchers 97 ublished in 1997 by the Centre for Port and Maritime History Liverpool

troduction

he history of cholera reflects the social onomic and medical history of the nineteenth ntury Barely recognised before the early neteenth century cholera has spread through the old in seven major pandemics bringing rapid ath to millions Originally an endemic disease the Ganges delta in West Bengal and the land ea is now Bangladesh its spread was facilitated y increased trade more rapid travel and dustrialisation which brought with it banisation and the poor living conditions of ge cities The great growth of commerce and ade by land and sea following the Industrial evolution led to ideal conditions for the spread of olera Four pandemics in the nineteenth ntury spread through tropical and subtropical untries where sanitation was poor and living nditions confined to Russia to China and ence to Europe and the New World ' Much of the read of cholera was by the trade routes cluding seaborne transmission of the disease hough much of this was by merchant ships the oyal Navy had its share and was on occasions sponsible for its spread

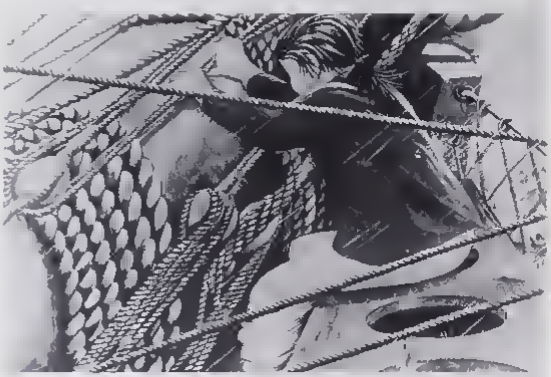
he Royal Navy 1815–1870

fter the Napoleonic war the Navy was rapidly n down There were no engagements at that time d sailors were laid off at the end of a voyage ne hundred and twenty thousand men had been aid off by 1817 The press-gang still existed but as required much less frequently after 1815 A ll of seamen was established and voluntary listment encouraged by bounties and a pension ontinuous service was not established until 1853 d there was no uniform until 1857 Officers too were laid off on half pay often for many years Promotion came late there was no retirement and many officers were old men when appointed to senior positions [1]

The ships of the fleet were in a similar state After the glorious naval victories and supremacy in the late eighteenth and early nineteenth centuries, suddenly the needs had changed Far fewer ships were needed and then mainly in a peace keeping role policing the seas protecting the merchant fleet and supporting the military in various parts of the Empire or in local skirmishes elsewhere Many ships were laid up and ship building stopped The ships at sea were old and built to old fashioned designs many of them based on eighteenth century French and American designs Conditions within the ships were as when they had been built Despite the improvements in conditions brought about as a result of the Spithead and Nore mutinies of 1797 accommodation was poor and cramped, usually damp and badly ventilated [4]

Experiments with steam power began early in the century but this was slow to be accepted by the aged and reactionary admirals Steam was used initially in small vessels but was then adopted as auxiliary power to manoeuvre in harbour The steamship was in use in 1827 but it was another twenty years before the superiority of the screw propeller over the paddle was finally accepted [5] Auxiliary steam engines with a propeller that could be raised for sailing were fitted into many older ships The first purpose designed steamship was HMS *Agincourt* launched in 1845 Conversion of old ships did nothing to improve living conditions on board Deck space below was cramped as ever and now filthy with soot oil and coal dust In the newer ships of the mid nineteenth century wood gave way to iron and then steel in construction Overall designs were still largely traditional and accommodation had changed little

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by the 1860s in most ships HMS *Warrior* launched in 1860 was the first iron hulled ship and was of radically new design Between 1860 and 1866 ships were built in anticipation of the threat from France both with wooden hulls protected with iron plates and with iron hulls The last wooden hull was laid down in 1866 [6]

Living conditions afloat were ideal for the rapid spread of infectious diseases and these were common Tuberculosis dysentery and various fevers were frequently reported and spread in epidemics through a ship However once at sea the acute infection was contained and would burn out with no opportunity to import new diseases until sailors went ashore and acquired them locally Venereal diseases were a particular problem ashore but any endemic conditions could be taken on board and spread rapidly Chronic conditions such as tuberculosis were difficult to eradicate, but acute enteric and febrile illnesses were usually self limiting eventually at sea

Food was poor especially on a long voyage when a ship was victualled for six months or more with food that could be kept James Lind s studies on scurvy[7] on long passages led eventually in 1795 to the issue of lemon or lime juice which abolished scurvy in the fleet but there were many other nutritional problems which contributed impaired immunity in the ship s company [8]

A major hygienic advance was that by 1815 major warships had iron water tanks deep down the hull Previously water was kept in enormo barrels in which it became putrid and infected, T barrels were taken ashore in the ship's boats to filled stoppered towed back to the ship winch on board and lowered into the stowage spac Even if not infected at source infection w rapidly acquired from contamination and t water became foul though it was reputed sweeten after three days or so [9] Many of the ship company would only drink beer from their o gallon daily allowance With the installation iron water tanks there was the use of mechanic pumps to transfer the water from the source board and into the tank This helped to red contamination further and the stored water w considered much more palatable [9]

Sanitation in ships is relatively simple everything goes over the side Toilet arrangemen were known as the heads because they were the ship s head or beakhead and always, plural they were on both sides of the ship so that those the leeside would be used and all excrement f clear of the ship The heads were traditionally

given hole in a limited compartment that opened directly to the sea below (*Figure 1*) In the control of infectious diarrhoea this had great advantages Ironically the sufferer could get himself to the toilet If not then contamination with virulent organisms would be rapid and difficult to contain in the low decks There were no great changes in these arrangements until later in the nineteenth century

This increasing awareness of the importance of good sanitation and hygiene ashore had some impact at sea This was largely manifested in a growing obsession with cleanliness of the ship and the ship's company Decks were scrubbed daily which resulted in much damp below Brass and wood were polished and all was pristine Clothing was often before uniforms was changed twice weekly and scrubbed thoroughly and, though this did not necessarily control infection, it did lead to general improvements in hygiene and a growth in appreciation of hygienic principles in living conditions catering and sanitation afloat.[11]

From 1815–1835 the Navy was run down drastically with a small fleet and limited manning The numerous stations around the world had smaller but more manoeuvrable vessels suited to more peaceful activity The West of Africa Station and the Cape of Good Hope Station were to control the slave trade from the west and east Africa respectively The East Indies (Indian) Station supported the East India Company in its government of India The China Station protected the merchant fleets against piracy and became involved in the Opium wars of 1839–42 and 1856–60 The West Indies North American and Brazil (East Coast of South America) stations all protected the interests of Britain and the Empire in those places The North Coast of Spain Station ensured peace was maintained in Spain and Portugal after the Alliance Treaty of 1836 and was also offshoot of the Mediterranean Station This last station saw very varied activity during this period Fleets were sent to the Black Sea and the Baltic before and during the Crimean War supporting the Turks against the Russian onslaught

The Navy expanded quite rapidly between 1835 and 1842 with activity increasing and again in 1855 in the recovery from the Crimea In the 1860s there was considerable and costly expansion as new ships were built using new technology and designed for new strategies[12] By then the Navy which had become an ageing and rundown fleet suddenly caught up with the enterprising and innovative spirit of the Victorian age

The Health of the Navy

Life at sea is always hazardous The dangers of physical injury and risks of shipwreck and drowning were obvious but there were also the risks of extreme physical conditions of malnutrition and of infectious diseases Henry VIII established a permanent medical service at sea and ships of the Royal Navy routinely carried a surgeon from the early sixteenth century onwards with the exception of the smallest vessels and those on limited coastal passages They kept records of their patients and their illnesses as well of factors which might affect the health of the ship's company By the early nineteenth century they were *required by Admiralty Instructions to transmit to the Physician General of the Navy . . . a Daily Sick Book, Monthly or Three Monthly Nosological Returns and a Journal of Medical and Surgical Practice*.[13] This reporting was later formalised further[14] and continues to this day

The Journals were accumulated but no analysis undertaken routinely these reports being used anecdotally Sir Gilbert Blane undertook a review of the records to highlight the progressive improvement of the health of the Royal Navy which he published in 1830 His evidence was limited because the records were incomplete and many of the statistics were based only on hospital admissions ignoring deaths at sea etc He reported that in 1782 one in 3 3 of the fleet was admitted each year whereas by 1829 only one in 8 9 was admitted[15] He concluded that the improvement could be attributed to five causes

> *circumstances less conducive to the engendering and diffusing of infection than in former wars better observance of cleanliness ventilation dryness and sobriety the general supply of lemon juice so judiciously and generously allowed to ships of war since the year 1795 the regulations established by the Medical Board of the Navy [1795] and the superior encouragement given to medical officers which has had the effect of procuring a better educated class of men*[16]

Blane's figures were attacked by Thomas Wakley the editor of the *Lancet* in the columns of the journal in 1838 He exhorted the medical directorates of the Army and Navy to issue standardised and tabulated returns annually In fact in the 1836 Sir William Burnett, the Physician General of the Navy through the Lords Commissioners of the Admiralty had

commissioned an inquiry into the health of the Navy The first officer appointed to do this died suddenly and in 1837 John Wilson MD took over in the same year that the Office of the Registrar General was established The first volume of *Statistical Reports on the Health of the Navy for the years 1830–1836* was published by Order of the House of Commons on 24 March 1840 and covered the health of the South American West Indian and North American Mediterranean and Peninsular commands The second part was published on 5 October 1841 covering the Cape of Good Hope and West Coast of Africa and East India commands the Home and various forces. along with totals for the seven years Both volumes have a long introduction by John Wilson commenting on conditions afloat improvements made and the pattern of disease reported In the first volume he discusses the fatigue involved in the two watch system the overcrowding below decks the elevated temperature and deteriorated air and whilst admiring the cleanliness of the ships says the cleaning of decks is carried too far because the quantities of water used make the ship damp below He attaches great weight to adequate ventilation [1] He compares morbidity and mortality in the different commands and then updates Blane's mortality figures of 1779 and 1811 thus

> In 1779 the proportion dying was 1 in 8 of the employed
> In 1811 the proportion dying was 1 in 32 of the employed
> From 1830 to 1836 the average number dying annually was 1 in 72 of the employed

He emphasised that these figures included all deaths and said they were eloquent beyond any words [17]

These figures were encouraging and much more complete than any earlier data but the classification of disease used by Wilson was the Cullen classification into Febrile Nervous Cachectic and Local Diseases Each major group is then subdivided into smaller groups though there is much potential overlap Cholera for example might be placed under Febrile Diseases as inflammation with fever including acute inflammation of the bowels or Fluxes with fever or under Nervous Diseases as spasmodic diseases including diarrhoea cholera colic and epilepsy or even under Cachectic Diseases as Emaciation of the body consumptive diseases of the alimentary system [18] This classificati n continued in the reports until in the 1869 repo t the Navy adopted the Nomenclature of diseas recently issued by a joint committee appointed the Royal College of Physicians which l became the standard of classification for differ t public services [19] This was a more anatomi cl classification based on systems of the body wh h placed cholera unambiguously into Group I General diseases Section A, with other infectio s and tropical diseases

Alexander Bryson MD took over responsibil for *Statistical Reports on the Health of the Na 1837–43* which were published in three parts P t 1 published 28 June 1849 covered the Sou h American Station North American and W t Indian Station and Mediterranean Station Part published on 1 June 1853 the East India (a I China) Station and Part III published on 7 August 1854 on the North Coast of Spain Statio Cape Station West Coast of Africa Station Pacf t Service Home Station and Ships Employ d Variously As political imperial and econo circumstances changed so did the activities of t Navy The stations (or fleets) had changed a l direct comparison is difficult

Bryson's commentary and conclusions much less verbose and more factual than Jo Wilson's Bryson was statistically minded a d wanted the reports to be clear In Parts II and III deviates from the Cullenian method which s describes as an arrangement so antiquated n evident that no very satisfactory results could deduced [20] Though the returns were in t Cullenian form he analyses the diseases systems anticipating the new RCP classificatio The average mortality over the seven years 13 4 per 1000

By the time Part III had been published t Army and Navy were on the brink of the Crime War which continued to 1856 No statistic reports were issued covering the years 1844– but from 1856 annual reports were and still issued Alexander Bryson continued as Editor s did much to improve the quality of reporting a statistical analysis Bryson edited the reports 1860 and then handed over to Alex E Mackay M FRSE who continued until 1875

Over the years 1830–60 which had been an e of great health reforms ashore there h apparently been little improvement in the health the Navy In 1830–36 the mean strength employ was 157 770 and there were 210 772 cases disease or injury (1332 8 per 1000) with 2 1 deaths (13 8 per 1000) By 1860 die total for

was much smaller at 64 025 but there were 90 329 cases of disease or injury (1410 8 per 1000) and 4 18 deaths (14 7 per 1000)[33] However as Mackay pointed out two years later these figures must be given in context He noted

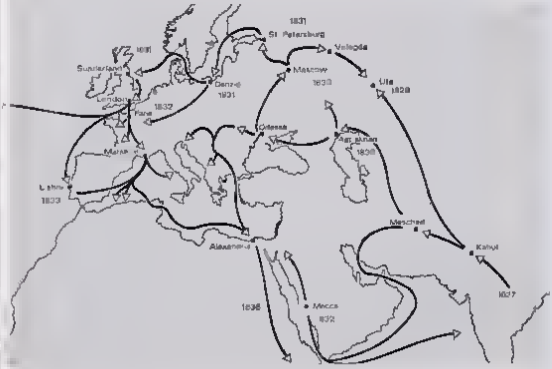
there is no sphere in life in which more ready access to medical advice can be had than in the Royal Navy . . . a very large proportion indeed of the sick rate in the Royal Navy is derived from boils abscesses ulcers and injuries of a more or less trivial nature . . . and that the ratio of sickness from disease properly so called is in reality very small

He also commented on the mortality ratio of 15 3 per 1000 and suggested that by omitting deaths from casualties and those due to infectious such as cholera and yellow fever the death rate will be reduced to be only 9 6 He compared this with the Registrar General s figures for those aged 15–45 principally engaged in out-door avocations amongst them the ratio of mortality is 9 1 per 1000 [34] There was also an increasing emphasis on preventative medicine with the medical officer being required to be attentive to every circumstance that may occur or in any degree tend to affect the health of the ship s company [and have] an intimate acquaintance with prophylaxis or the science of the prevention of disease' [35]

Cholera and the Navy 1817–1867

Until the nineteenth century cholera was confined to the endemic areas of Bengal and to an extent China Cases were recorded there in both the indigenous population and in European merchants and the Army ashore but only few and isolated cases were reported in the Navy There were continuing conflicts in India between 1746 and 1818 but British involvement demanded little of the Navy

The first evidence of the spread of cholera involving the Navy was the incident in the first pandemic in which the frigate HMS *Topaze* was believed to have carried cholera from Ceylon to Mauritius in 1819 [36] Because of its short incubation period and fairly rapid clinical course to either resolution or death cholera has less chance of being spread via a long sea passage because within the ship it would either have burnt out or decimated the entire ship s company A



The spread of cholera through Europe by sea and land in the first pandemic 1817–1834

ninety day passage from India a much less likely route for the spread than a twenty day passage from Ceylon to Mauritius

Though there were Naval ships on the various stations in the East Indies the African coast the West Indies and the Americas they appear to have been protected from the early spread of cholera by their pattern of operation There was certainly seaborne spread of cholera in the early pandemics but this was largely by merchant ships on relatively short passages

In the summer of 1831 the whole of Europe was in the grip of the first pandemic with particular foci of infection in the poorer areas of sea ports which had inadequate sanitation *(Figure 2)* The Baltic and German ports were badly affected and it was through Hamburg that the disease was imported to Sunderland probably actually arriving two months before it was officially declared [27] Spread within Britain was probably not only by road but also in coastal shipping to other ports *(Figure 3)* There was a bad outbreak at Ayres Quay on the Thames near Deptford in 1831

At this time there were two hospital ships *Dreadnought* (the predecessor of the Seaman s Hospital) and *Iphigenia* moored off Greenwich The epidemic was sufficiently bad in the port that HMS *Dater* was adapted as a hospital ship to accept up to 200 merchant seamen HMS

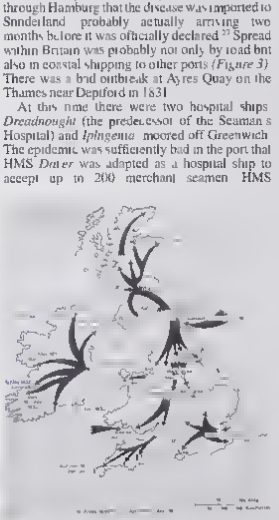


Figure 3 The spread of cholera in Britain in the first epidemic Deaths in the port areas

Tremendous was fitted out in 1832 to receive na ratings off Chatham [28]

The first collated statistics which have ma flaws since they only reflect what happened in fleet and not ashore or in the hospitals are in *Statistical Report on the Health of the N. 1830–6* In the Cullea classification there we 19 284 cases of spasmodic diseases includ diarrhoea, cholera colic and epilepsy of wh 150 died over the seven year period Cholera separated as a principal disease with 477 ca reported (3/1000 of mean strength) 42 w admitted to hospital and 84 died (18%) n 1830–6 [29] Wilson comments that these are cases Asiatic cholera and that more than half of t fatal cases thus classed occurred beyond the lim of the Indian command [30] The total number cases quoted in the summary does not mat exactly but in the fleet there were 416 cases which 220 were on the East India station and 96 the Mediterranean/Peninsular station and the e were 78 deaths reported "Cholera had arrived n the Mediterranean and European ports

The *Statistical Report* for 1837–43 [31] sho increasing numbers of cases of cholera and a wid distribution as the pandemic spread on to invol West Africa and the Americas The total numbe for all the stations for 1837–43 were 1261 ca and 161 deaths The East India and Mediterrane stations accounted for 886 of these cases and 1 of the 161 deaths [32]

Prior to the establishment of transatlan steamers the mails were carried by the Pacl Service to the West Indies North America a eastern South America by small vessels usua gun brigs which sailed from Falmouth w regular local crews The North Coast of Sp Station was a guard fleet which spent much time anchor policing the Treaty of Quadruple Allian of 1834 for the pacification of the Iberi peninsula This was withdrawn in 1840 The Ca Station monitored possible slave trading fr Mozambique and Zanzibar and comple mented West of Africa Station The Home Stati represented a mix of seagoing smaller coas ships and harbour ships used as depo accommodation and guard ships The Shi Employed Variously were all those not otherwi included, ships in transit between stations bei commissioned or decommissioned fitting out, e

Though there were three times as many cases cholera at a time when the Navy was increasing size again (21 141 in 1835 rising to 36 181 1846) the mortality had fallen by a third fro 18 8% to 12 8%

Cholera was particularly severe in the Mediterranean in 1837 and this was attributed in part to the two years that the fleet spent off Syria. Singh Malm became a frequent source of infection from 1837. On the East India Station there were no Naval Hospitals so temporary facilities were established at Trincomalee in Ceylon and patients and casualties were also admitted to hospitals in Calcutta Madras Bombay and Canton prior to the arrival of the HMS *Minden* hospital ship at the month of the Yangtze river in 1842 with John Wilson the author of the reports as senior physician. There were numerous cases of diarrhoea and dysentery during the Opium war with China in 1839–42 particularly in 1842 and 1843.[33] From July to October 1842 she took on board 107 cases of cholera and 1313 cases of dysentery. There were 3 died of cholera out of a total of 38 deaths. By 1843, cholera was on the decline in China and in Hong Kong by 1844.[34] All the fatal cases of cholera in the ships employed variously were all contracted in ports where the disease was prevailing generally amongst the inhabitants on shore.[34]

From 1844 to the early part of the Crimean War in 1854, the Naval records became sparse and have never been fully analysed. Bryson did not complete the analysis of the 1837–43 records until 1854. At that stage he set up an updated and more suitable method of data collection which facilitated analysis and became the basis of the annual *Statistical Reports* from 1856 onwards.

In September 1853, Turkey declared war on Russia but lost its fleet to them at Sinop in November 1853. In order to defend the Turkish coast an Anglo French fleet entered the Black Sea in January 1854. France and Britain jointly declared war on Russia in March 1854, building up troops and the fleet in the summer of 1854 prior to an allied landing on Crimean peninsula and the Siege of Sebastopol in September (*Figure 4*). The allied armies gradually gained control and the peace Treaty of Paris was signed in March 1856.[36] British losses were 4 600 killed, 13 000 wounded and 17 500 died of disease, unfortunately cholera. The Army took the worst of this but the Navy was badly hit in 1854. At this time there were 62 000 men in the Navy and the fleets against Russia were deployed to the Black Sea and the Baltic. The ships were well equipped, victualled and supplied but there were few surgeons especially on the hospital ships. The Army were deployed in a number of places including Varna in the Danube delta.[37] This was also the most malarial area of Europe but quinine prophylaxis controlled that.

Cholera was imported from southern France with troops landing at Gallipoli in June and by July 1854 was severe in the fleet, the first British case being in HMS *Diamond* on 16 July, ten days after a French steamer in which cholera was prevalent arrived from Toulon.[38] Cases were then reported in HMS *Sanspareil* which had been in contact with an infected French ship and subsequently in HMS *Queen* and HMS *Agamemnon* in which there were 31 cases of cholera, 49 of dysentery and 277 of diarrhoea. The flagship HMS *Britannia* had 69 cases of diarrhoea amongst 995 men on 30



Figure 4 The Crimean campaign cholera spread with the fleet and the troops

July but by 9 August there was [illegible] cholera She put to sea in bad weather and continued there for five days during which there were 201 cases of whom 93 died She returned to anchor the crew were transferred to other ships and only 22 further cases occurred in total of 229 cases of cholera with 139 deaths HMS *Terrible* had a severe outbreak on 14 August and in HMS *Albion* there were 97 cases of whom 68 died HMS *Trafalgar* had 116 cases and 33 deaths The total number of cases in the British fleet of 12 572 men was 760 with 411 deaths A further 4,573 cases of a choleraic nature were reported [38] No cases occurred in ships supplied with distilled water [39] Cholera was already in the Baltic ports in 1854 The British fleet in the Baltic had 310 cases with 108 deaths Infection included the flagship HMS *Duke of Wellington*

The army ashore were so badly afflicted by cholera and other disease and injury with chaotic medical and logistic support that each ship formed a Naval Brigade to go ashore Twelve hundred went ashore with a similar number of Royal Marines and subsequently a further 831 Marines They manhandled and manned the guns (foreshadowing their role at Lady smith and the origin of the Field Gun competition) The Naval Brigade coped extremely well and the medical resources afloat were far superior to those ashore in facilities and organisation The Brigade over the whole war had a casualty rate of 10 5% of which 7% were wounded In 1855 there were 80 cholera deaths in the Navy at the Crimea Typhoid was also causing diarrhoeal illnesses ashore but there were few naval cases After the initial virulent and acute outbreak amongst an ill prepared Army and fleet cholera persisted ashore There were 18 400 cases of cholera in 1855 with 11 000 deaths In its early days it nearly lost the allies the war at Crimea [37]

The reported naval mortality for the Crimean campaign from diseases of the stomach which was mainly cholera was 127 for the Baltic fleet and 734 for the Black Sea Total deaths were 2 009 with only 455 from wounds and accidents The British Army lost about 96 000 including 18,000 from disease the French 309 000 with 24-000 from disease and the Russians 500 000 [40] Disease had come to play a major role in prolonged warfare and cholera had played a critical role in the stumbling start to the war

The Crimean War stimulated the Admiralty to resume publication of the *Statistical Reports* in 1856 It may not be entirely coincidental that after appalling losses at the Crimea the Army started to produce their own reports from that year Bryson introduction emphasises the great importance information respecting the absence or presence disease on shore the movements of the ship or t exposure of her men previous to the eruption epidemic or infectious diseases [41] In this year t thirds of febrile cases occurred in the China waters Yellow fever and continued and remitt fever was increasing There were 42 cases cholera including 23 from the Mediterrane (seven died) and eight from the East India/Chi command (four died) Total deaths were 16 [42]

During most of the years between 1857 and 187 there were around 50 cases of cholera in the Na each year with a death rate between 16 and 62% However 1858 at the end of third pandemic wa particularly bad year with 176 cases and 110 deat on the East Indies/China station (and the only fi other cases and three deaths elsewhere were Woolwich) [44] Likewise 1862 at the beginning the fourth pandemic saw another major outbre on the same station with 141 cases and 89 deat with 29 other cases elsewhere and only one oth death There were also outbreaks of primary fev and smallpox in that fleet Most of the ships in t China seas had outbreaks of cholera in that year [45 contrast 1861 and 1864 were quiet years wi twelve[46] and eighteen[47] cases respectively

Concern about further spread of cholera and t importance of its control led to the issue *Sanitary Precautions in Regard to Cholera*[48] the Admiralty on 3 August 1866 which ga detailed instructions about inspection of all m decks hygiene treatment of the heads and discharges using chloride of zinc as a disinfect (See Appendix) The application of the principl embodied in these instructions effectiv controlled cholera in the Royal Navy [49]

In 1867 there were only 13 cases in the Navy b still six deaths Both South American cases die three of the six China Command and one of t three Irregular Forces cases died The two Hon cases survived [50] By 1868 the number of cases t to eight with five deaths Over the next twel years there were rarely more than ten cases a ye which were mostly sporadic with on average deaths [51]

Conclusions

For the Royal Navy the whole history of chole was over in fifty years from the beginning of t first pandemic in 1817 to effective eradication the disease in the fleet by 1867 follow implementation of the Admiralty Instruction August 1866

APPENDIX

SANITARY PRECAUTIONS IN REGARD TO CHOLERA Admiralty 3 August 1866

In view of the epidemic of cholera which is at present prevailing in the United Kingdom my Lords are pleased to issue the following instructions to officers commanding Her Majesty s ships and vessels on the Home Station and to colonels commandant of marine divisions

There appears to be little doubt that in the present state of knowledge with respect to this disease any hope of successfully combatting it is very much limited to its earliest stage that of the premonitory diarrhoea and it is to the fact that patients rarely present themselves to the medical officers until that stage is past that the great mortality it occasions is attributable As no amount of experience on the part of the men themselves and no advice given them appear to be of any value in inducing them to prevent themselves at an earlier period it will be necessary to institute such measures as may permit of a daily knowledge of the general state of health of the individual members of the ship s company and of the men in barracks being obtained For this purpose my Lords direct—

1 That the petty officers of messes be desired to exercise an unobtrusive watchfulness over the men composing their messes that they report to the medical officer any man whom they may know or have reason to suspect to be labouring under diarrhoea, or who may appear to be in ill health and that it be impressed upon them that by evincing an intelligent interest in this direction they will do much to prevent any outbreak of cholera on board

2 Once daily at least at a time when the majority of the men are in their messes a medical officer shall go round the different mess decks and confer in from the petty officers of messes whether there is any one requiring his attention

3 The officers of divisions when inspecting their men shall take notice of any man who may appear to be in ill health and shall cause him to be once taken to the sick-bay and reported to the surgeon

4 Twice daily at least the head shoots as well as the shoots of the different water closets in the ship which are much used shall be washed down with a solution of chloride of zinc in the proportion of one part of Burnett s solution of chloride of zinc to thirty of water or chloride of lime may be freely used instead and instructions shall be given to the captain of the head to report to the surgeon any man who from making repeated use of it may be subject to the labouring under diarrhoea.

5 Should cholera have established itself on board any ship the utmost care is to be taken that the choleraic discharges whether from the stomach or bowels are largely mixed with the solution of the chloride of zinc or some other disinfectant before they are thrown away and that any clothing or bedding contaminated with the discharges be destroyed

The above regulations *mutatis mutandis* will apply to the different marine barracks

The non commissioned officers of the different rooms shall be directed to exercise a watchfulness over the men of the rooms and report to the surgeon of the division or to the medical officer on duty any may who may be known to them to be labouring under diarrhoea or may appear to be in ill health

Once daily at least at a time when it may be considered most desirable a medical officer shall visit each room in the barracks and ascertain from the non commissioned officer of the room whether there is any one requiring his attention he will also in the same manner and for the same purpose make a room to-room visitation of the married men's quarters

On parade officers of companies shall note any man who may appear to be in ill health and shall cause him to be at once brought under the notice of the medical officer

The different privies in the barracks shall be washed down twice a day with the solution of the chloride of zinc or chloride of lime and every care shall be taken to keep them as pure and inoffensive as possible

Choleraic discharges and clothing or bedding contaminated with them are to be dealt with as noted above

Care is to be taken that the water supplied to Her Majesty s ships and to the marine barracks is in all respects free from organic impurities

By Command of their Lordships
Henry G Lennox

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1 Only the first four affected Europe and north America seriously There were two more pandemics in the nineteenth century mainly affecting tropical areas The seventh pandemic which started in the Celebes in 1961 continues in tropical areas of poverty though some believe that an eighth pandemic is happening now rather than this being a continuation of the seventh See

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J Royal Naval Medical Service 1997 83 3 157–159

Letters to the Editor

Dear Sir

I would like to take this opportunity to publicly congratulate Surgeon Lieutenant E M Armstrong on winning the Commando Medal. I was awarded it 21 years earlier in June 1976.

I thought your readers might be interested to know more of the Commando Spirit. The medal is engraved for 'leadership unselfishness cheerfulness determination courage'. These are all the qualities expected of an officer and for an officer to be awarded the medal, he must have been in abundance.

I wish him the best of luck in his Naval career—this is a superb start.

Surgeon Commander D I Riddell MBE MD RN
Upper Chesthill Cottage
Glen Lyon
Aberfeldy
Perthshire PH15 2NH

Dear Sir

I was delighted to read Surgeon Lieutenant Suzanne Porter's account of her adventure in the recent Journal possibly not the first time a Naval Medical Officer has been given a floating command but surely the first time a lady doctor has had that privilege from her Captain.

One thing puzzles me among the six of *Ruth's* crew is Lieutenant D Dalenn USN described as navigator yet when electrical power failed a position or even a meridian latitude was beyond them. I cannot believe that HMS *London* did not own have a spare sextant or set of tables in an almanac or aren't such things taught these days?

I am Sir
your obedient but mystified servant
Geoffrey Bolt VRD TRCP
(Board of Trade Yachtmaster)

Surgeon Lieutenant Porter replies

Dear Sir

It gave me great pleasure to receive Dr Bolt's kind acknowledgement. In answer to his query Lieutenant D Dalen USN who is an Officer of the Watch on board HMS *London* was given the task of being *Ruth's* navigator and a sextant was made available for us to take on our voyage. However in the organised chaos which prevailed in the hours prior to our departure this invaluable item was overlooked! I have since learnt that use of the sextant is no longer taught in the United States Navy—though Lieutenant Dalen has assured me that he does know how to use one.

Surgeon Lieutenant Suzanne Porter RN
HMS *London*
BFPO 328

Dear Sir

Community Psychiatric Nurse liaison deployment HMS *Cumberland* – personal view

I started out as a Probationary Medical Assistant in 1988 completed training in 1989 and went on to serve in several shore establishments then after a brief period in submarine training I decided to train as a Registered Mental Health Nurse within the Royal Navy and applied for transfer. After a brief period in submarine training I entered the nursing profession in 1991 and have now been involved in nursing in the Royal Navy for some six years both as a student and a qualified Registered Nurse. Since completing my nurse education I have achieved a Bachelor of Arts degree with honours in Community Studies in my own time and the Royal Navy is now funding my Community Psychiatric Nurse course at the University of Portsmouth. I commence my Master's degree in September 1998. Altogether I had served in the Royal Naval Medical Service for some nine years before I had the opportunity to experience life at sea when I arranged to spend 14 days at sea on board HMS *Cumberland* in Summer 1997.

I feel that the distance between Community Psychiatry and the Fleet is sometimes too great. This liaison visit was an attempt to bring these two very different disciplines closer together in order to dispel myths and to help to reduce the effects that stigma can place on service personnel asking for help support and guidance. It was an attempt to bring about a more positive attitude towards psychiatry as well as to broaden my own personal experience and through serving on an operational warship appreciate what the crew had to contend with and the stresses and strains that may result in referral to the psychiatric services.

Though recent research indicates an improving situation stigma and negative attitude towards

... ary have ... which both ... professionals and the clients they serve have had to contend the belief that real men do not seek help complain or acknowledge emotional distress exists in an intensified form in most military settings. My own research for my BA honours degree indicated that the majority of people in the military have qualms about being referred to a member of the psychiatric team for fear of loss of face loss of promotion and ultimately loss of career[2]

I am a fairly confident person but the first step on to the ship induced an adrenaline burst to match any in the fight or flight response I was lucky in that I had a friend and colleague the ship's Petty Officer Medical Assistant, to take me round explain the routines and show me where I would be living sleeping and eating for the next fortnight I began to understand the apprehension that anyone going to sea for the first time would experience on joining the different smells the close cramped conditions and the intimate style of the life on board with no opportunity to get away from it all and go home at night It did not take too long for me to find my feet and settle down to life on board and as indicated by the cessation of the 'Do you think I'm mad Doc' comments the ship's company's nervousness about my presence on board soon abated

This trip gave me an insight into the problems that sailors experience when away from home and their loved ones. It has definitely equipped me with the skills to empathise with my client group and (albeit only for fourteen days) it will improve my future practice as a Royal Naval community psychiatric nursing practitioner There were also chances to reduce some of the stigma and negative attitudes that are associated with military psychiatry Some of those on board are now more aware of techniques to combat psychological distress and have a clearer understanding about how they can make the best of difficult situations

I believe that in an ideal situation the placement of CPNs strategically among key ships and units within the Fleet, could further reduce both the stigma and problems associated with lost man hours through mental ill health I wish I had had the opportunity to go to sea earlier and as part of my training

I would like to express my gratitude to the Commanding Offer Captain R D Leaman OBE RN Commanding Officer Lieutenant Commander P R Cook RN Executive Officer and Petty Officer Medical Assistant D S Parker of HMS *Cumberland*

G T Poulter
POMT(M)
Department of Psychiatry
RH Haslar

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Dear Sir

Royal Naval Hospital Sydney, 1945–46

I have read with interest the articles *The Navy to the Rescue or from Scapa to Sydney and home again fifty years ago* by Sir Cyril Clarke and *Some further memories of Royal Naval Hospital Sydney* by Mr James Wishart in Vol 82 the Summer 199[6] issue of the Journal

For the past few years I have been researching the Royal Naval Hospital and the US Army Hospital which preceded it, in the Sydney suburb of Herne Bay I am a local historian in the area of Sydney in which the hospitals were located and my intention is to publish a history of the hospitals from construction of the buildings to their use for emergency housing after the war

The first to occupy the site was the US Army's 118th General Hospital This was a unit formed by doctors and nurses of the John Hopkins University Hospital in Baltimore Maryland The unit comprised 42 officers 6[?] nurses and several dietitians physiotherapists and American Red Cross workers and approximately 275 enlisted men After unsuccessful efforts to find premises of its own following its arrival in Sydney in June 1942 arrangements were made to share accommodation and facilities at the Royal Prince Alfred Hospital Sydney. Thus opened in August 1942 Later the Hydro Majestic Hotel at Medlow Bath in the Blue Mountains to the west of Sydney was also used

Subsequently the Australian Government built a new hospital of one storey temporary buildings at Herne Bay under Reverse Lend Lease. Following a series of requests by the US Army during construction the number of patient beds was increased to 4 250 in two 1 000 bed and three 750-bed hospitals. The first section of the complex was occupied in May 1943 By November 1943 the bed census at Herne Bay reached 1 700 and thereafter declined In October

1944 the 118th left Sydney to be part of the invasion of the Philippines. After service there for the remainder of the war the unit was deactivated.

December 1945. Between the departure of the 118th and the arrival of the Royal Naval Hospital in January 1945 the US 153rd Station Hospital occupied the site.

RNH Sydney occupied only part of the hospital complex at Home Bay—three hospitals which previously totalled 2 500 beds in an area of 70 acres. As all equipment had been removed and the Royal Navy used the buildings differently from the Americans the bed numbers are indicative only. (Australian Army hospitals used the other areas, the last not being vacated until March 1947.)

The hospital opened for patients on 10 January 1945 with a proposed bed strength of 2 000. (I understand that it was the largest hospital in the history of the Naval Medical Service.) The admission figure of 172 in February 1945 had increased to 786 in June 1945 by which time 1 400 beds were ready for occupation. By the end of June 990 beds were occupied by 535 medical and 455 surgical patients and the ultimate bed strength had been reduced to 1 750. During its life the hospital received and treated 9 003 Service patients. There were 160 nursing sisters.

Surgeon Rear Admiral Joseph Archibald Maxwell, CB CVO OBE, was Medical Officer in Charge, Miss Kathleen Baker RRC RRC ARNNS was Principal Matron, and Miss Ellen Bennett was VAD Commandant.

Three of the activities associated with the hospital are worth mentioning. First from April to September 1945 as part of a Royal Naval Medical Air Evacuation Unit six teams of a Nursing Sister and a Sick Berth Attendant from RNH Sydney regularly flew with sick and wounded patients from Manus Island north of New Guinea to Sydney a distance of about 2 100 miles.[2] Second after the war ended in August 1945 three aircraft carriers were directed to undertake the repatriation of ex prisoners of war and each carried five Nursing Sisters and twelve VADs from RNH Sydney. Third the hospital itself was used as a reception and rehabilitation centre for prisoners of war and civilian internees released from Japanese prison camps.

A brief souvenir publication *Herne Bay Record* with a number of illustrations was published in April 1946 but a Foreword, SRA Maxwell predicted correctly that in a short time new buildings would have transformed Herne Bay beyond recognition. Even the name of the suburb was changed—to Riverwood.) He concluded: 'When we have returned there [to Britain] this record will remind us of that corner of Australia in which we met so much kindness and where for a brief space was created a very tolerable Royal Naval Hospital.'

The date of closure of RNH Sydney is not known but it was in May or June 1946. By this time the Housing Commission of New South Wales was taking over buildings as they were vacated to convert them into emergency housing units for families.

Other than those quoted by Coulter and despite diligent searching at the Public Record Office at Kew and elsewhere it has not been possible to locate more detailed figures for numbers of staff or patients, including the ex-POWs and civilian internees. If any reader can assist with further information about the hospital, supply reminiscences or provide even estimates of staff and patient numbers at various times I will be most grateful. This will help to make the history of the hospital more complete and its important role will be better appreciated. My address is:

Mr B Madden
19 Marcella Street
KINGSGROVE NSW 2208
Australia

Thank you.

B Madden

References

1 Coulter JLS. *The Royal Naval Medical Service*. Vol I. Administration. London: HMSO 1954.
2 Mathews M, Harris M. The Royal Naval Medical Evacuation Unit. *JR Nav Med Serv* 1980; **66**: 147–151.

Dear Sir

Netley Hospital Reunion and Display

The Netley Hospital Reunion and Display will take place at the Royal Victoria Country Park, Netley on 14 May 1998. This will include a March Past, Historical displays and Sunset ceremony. Any current or former members of the Royal Naval Medical Service who wish to attend is invited to contact me for details.

Patrick Kirkby
2 Culver Road
Winchester
Hants SO23 0EX
Telephone 01962 869698 (evenings)

Book Reviews

Food and Fitness: A Dictionary of Diet and Exercise Michael Kent Oxford University Press June 1997 Pp 383 £25 00

With the profasion of Sports Sciences and Excerise Studies degrees in the UK this dictionary is aimed at students of these aad more traditioaal Physical Edacation coarses whilst also being a useful refereace to the health care profcsaional

It provides information on a wide range of general topics such as traiaag methods aad principles basic autrition injaries aad diseases and illaess related to sports In additiou there are six appendices relating to food composition estimated caergy expeadsture of various sports aad raings of sports in terms of stamina strength and flexibility

The maia text is logical aad potentially confusiag terminology sach as isokinetic aad isotonic mascle coatractions are well explaiaed in sufficient detail for the undergraduate or the sports enthusiast The advice regarding exercise training and the avoidance of drugs or ergogeaic aids is soand and based upon scieatific evidence Memorable aaecdotes are used to illastrate or reinforce the occasional eatry for example the use of "Proz ic by Alberto Salazar in the 1994 Comrades Marathoa in South Africa is cited as aa example of the use of this drug to combat mental fatigue associated with overtraiaing

The appendices lack sufficient detail to be of any use to most readers and the use of Dietary Refereace Values Reference Natricat Intekes and Recommeaded Dietary Allowaaces in the same text without sufficient explaaatioo is confusing

Overall this is a handy first resort for the sports studeat or eathusiast PE coach aad possibly the armchair sportsmaa

Adrian J Allsopp
Head of Applied Physiology Dept
Institute of Naval Medicine

Self-Assessment Colour Review of Renal Medicine Timothy H J Goodship and Bradley J Maroat Oxford University Press (Manson Publishing) February 1997 Pp 192 £14 95

If the rest of the books in this series approach the generally high standard of this one then the badding Physicaa aeed look no farther Three to four evenings of study armed with a larg textbook for reference will allow the Membersh caadidate to acquire more than enough knowled of Reaal Medicaa for that exam As the avera SHO has litde exposure to the Dialysis/Transpl patieat, this book is especially asefal—i pictures are first class and the explanatioas lat and to the point

As with all Reaal Medicine there is plenty interest here for the Geacral Physicaa It will al he of ase to the SHO or Registrar starting on Reaal Unit For the Geacral Practitioner with rer patients it would be a very good way of raptic gaining eaough knowledge to help in th management

Books of this size must by necessity take didactic line and this one is no exceptioa A resalt it does occasionally mislead for example implies that the Angiotcasin Coaverting Eazy Inhibitors are always the drug of choice in Ker Disease by ao means the case

The contributors represeat a roll call of emine clinical Nephrologists Strongly recommended

N A Hedg
Surgeon Commanc
Actaag Consultant Physici
Royal Hospital Has

Stedman's Concise Medical and Allied Hea Dictionary Third Editaon Ed John H Dirc Waverley Europ. Ltd (Williams aad Wilki May 1997 Pp 1098 £15 95

I am not sure at whom this dictionary is aimed. T sleeve states that it is for studeats professionals in the medical and allied hea professions but I am uncertain who would bea from this book It is certainly very compreheas with over 1 000 pages inclading colour sectio on Anatomy and diagnostic photographs toget with a large aumber of appendices In f concise may be stretching the point The lay is very easy to ase oacé oac is familiar wit and the defiaitions are easily comprehensib Proaanciation is given together with etymology Synonyms and cross references also offered for most eatries

However it seems to fall betweea two stools offers too much detail for the complete layman

falls short of being an alternative to the Merck
Manual or Oxford Pocket Books for health
professionals. Much ground is covered in many
areas but not adequately enough to replace a
textbook. For example, there are very nice pictures
of retinal pathologies and problems with tympanic
membranes but the detail is insufficient for any
clinician to use without further texts. There is no
information on diagnosis nor management of the
conditions covered. As a general reference book
though it appears to be excellent a starting point
from which to explore further. It may answer some
questions completely but will at least point the
way to the solution in the rest.

In summary, Stedman's Concise Medical and
Allied Dictionary is very comprehensive and
detailed and must be among the better examples of
such works. However it appears to be trying to
cover too much ground and falls short of replacing
any pocket text books. If you are looking to buy a
medical dictionary then I would recommend this
book (particularly as the review copy came with
the dictionary on CD Rom).

S W Millar
Surgeon Lieutenant Commander
Deputy Principal Medical Officer
HMS *Dolphin*

How to read a paper: The basics of evidence based medicine Trisha Greenhalgh. BMJ Publishing Group. May 1997. Pp 196. UK £14.95, Overseas £17.00.

Many doctors have misgivings about or outright hostility towards evidence based medicine with the perception that its *ration d'etre* is the discarding of all clinical experience not derived from double blinded randomised controlled trials published in reputable peer reviewed journals. Trisha Greenhalgh's lucidly written, highly readable and often amusing book should go a long way towards convincing even the most hardened sceptic of evidence based medicine's use and limitations in all areas of clinical and epidemiological practice.

With numerous examples gleaned from the literature, from ancient to recent, the author explores reasons for reading papers, how to find the papers you need to read, how to assess their quality, when you find them and how (or even whether) then findings should influence your day to day practice in the real clinical world. Chapters specifically devoted to meta analyses, guidelines and economic analyses provide a balanced view of areas that often appear obtuse or opaque to the busy clinician.

Many books are reviewed with the hackneyed description that they will repay the time spent reading them many times over. I make no apologies for applying it to this one. You might even enjoy it. As someone who rarely seems to get past the abstract of even the most interesting papers, I found its appeal lay in its infectious enthusiasm for the application of a critical, but unbiased eye to the literature, that is the distillation of all medical knowledge. Whether we like it or not, doctors and other health care professionals must all read papers or become clinical dinosaurs; this book should equip everyone from green medical student to grey professor to do just that.

Andrew Pitkin MRCP
Civil in Medical Practitioner
Undersea Medicine Division, INM

J Royal Naval Medical Service 1997 83 3 162–166

Obituaries

Surgeon Captain Patrick Blakie Nicol QHS, MB, ChB MRCPath, DPH, DIH died 28 May 1997 at the age of 83

Surgeon Captain David Dagliesh LVO OBE RN (Retd) writes

I was sad to hear of the death of Pat Nicol who died this May aged 83. We only served together once 1950–52 but we remained friends for the ensuing 47 years.

He was born in Cults near Aberdeen in 1914, the son of an Aberdeen GP, was educated at Glen Almond near Perth and read medicine at Aberdeen University qualifying in 1938. In September 1939 he joined the Navy when war was declared. During hostilities he served originally in destroyers leaving HMS *Encounter* in Singapore only days before she was torpedoed. In the latter years of the war he was appointed to HMS *Euphrates* for RNSQ Kharamshar in the Persian Gulf. Then followed service in Scotland until 1947 when he joined RNH Chatham to commence his specialty of Pathology. It was here that he met his wife Norah who was serving in QARNNS and they were married in the hospital church. In 1948 he was at HM Experimental Station Porton studying Bacterial Warfare and at sea in HMS *Bermuda* for Heat trials. Following this he served as Pathologist in RNH Plymouth where he obtained his DPH and DIH and then in HMS *Highflyer* as NMOH in Trincomalee then again in RNH Chatham as Pathologist and subsequently as squadron PMO in HMS *Maidstone* at Fislane and then another year at the RN Medical School during which time he was elected MRCPath. His last posting was as PMO Drake and in 1970 he was appointed QHS finally retiring in 1971.

After this he was employed by Rolls Royce in Derby in the Aero engine division and then as the Final Examining Medical Officer in the careers office in Glasgow.

Apart from medicine or more accurately Pathology Pat loved his music and using his hands making beautiful furniture when not enjoying his 30ft cabin cruiser on the Clyde.

His last years were a sad decline enshrouded however by his devoted wife. But for those who were fortunate to have served with him we recall a kind and gentle man possessed of a quiet sense of humour. We extend our sympathies to Norah their daughter Carolyn and the three grandsons.

Peter Ralph Helyar 29 February 1932–2 November 1996

Peter Helyar had a long career in the Ministry of Defence and virtually all his Service was with the Royal Navy. Each of his serves according to one individual and professional skill be it in uniform or as a civilian and Peter was undoubtedly one of the most devoted and loyal civilian colleagues the Royal Naval Medical Service.

He qualified in 1954 and following a few years in rural he joined the Ministry of Defence as a pharmacist in 1959. His first appointment was in Singapore. He since had various appointments in Gibraltar Plymouth and Scotland and from 1976 to 1980 served in the MOD. Most of his Service was in the Royal Naval Hospital Haslar where he worked continuously from April 1980. He was a private person at work but had a total commitment to the hospital and needs of the Fleet and a fierce loyalty to the Royal Navy. In April 1996 when his organisation became part of the Medical Supplies Agency and the hospital became the Royal Hospital Haslar he decided to stay on and see the changes through certainly to the advantage of the new colleagues who undoubtedly benefited from his experience and expertise despite the fact that he could have retired earlier.

His considerable knowledge and breadth of experience were most evident during the period of preparation for Operation Corporate and more recently for the Gulf conflict.

Few of us realise the enormity of equipping medical facilities afloat whether they be for the hospital in ARGUS for fighting ships and submarines or for the Royal Fleet Auxiliary. Peter Helyar frequently eroded his private time to ensure that the Royal Navy had the medical equipment it required. He was a workaholic and a perfectionist. Undoubtedly he sometimes frustrated the clinicians in Haslar by insisting that the paperwork for medical equipment was immaculate and fastidious. However once he turned his processing paperwork according to his strict demands he was most able to complete often expensive and complex purchases on behalf of the hospital. Undoubtedly Haslar was well equipped with a vast number of sophisticated and complex items of advanced medical equipment in the clinical departments. X ray nuclear medicine and pathology. The procurement of virtually all the

quipment was undertaken by Peter aad much of his was done at short notice in order to efficiently se potential underspends at the end of a financial ear Peter Helyar sadly died whilst still in post on 3 November 1996 He died suddenly having been rought urgently to the Accident and Emergency nit of the Royal Hospital Haslar where he had pent most of his working life

The influence of his endeavoars on behalf of the HNMS and more recently the MSA is seen in irtually all departments in Haslar today and unds as a fitting tribute

I L Jenkins
Sargeon Commodore
Defence Medical Postgradaate Dean

Mrs Kathleen Emily Ada Pole ARRC QARNNS

Captain P M Hambling ARRC QHNS QARNNS writes

Kathleen (Kay) Pole (née Funnell) died in the oyal Hospital Haslar on 26 July 1997 aged 70 fter a long illness most bravely borne She had a markable career rising to the rank of perintending Sister

She joined the Women s Royal Naval Service as Probationary Sick Berth Attendant on 5 June 951 at HMS *Daintless* and served in the Royal laval Hospitals Chatham Haslar and Plymouth nd the Sick Bays of HM Ships *Daedalus Curlew* nd *Gannet* progressing to Petty Officer Wren BA by March 1947 Throaghoat her Service as a Vren SBA she was assessed as above average in fficiency and was awarded the Associate of the oyal Red Cross in the Qaeen s Birthday Honours ist in 1959 In March 1960 she transferred to the laval Nursing Aaxiliary Section of Queen Iexaadra s Royal Naval Nursing Service and was promoted to Head Navid Nurse Auxiliary in December 1960 She successfully completed her tate Registered Nurse training in October 19h3 uring which time hor reports were consistently ood commenting on her excellent qaalities specially her reliability hur nursing skills her ympathetic manner and her undoabted officer otential

In December 1963 Sargeon Rear Admiral J M Holford Medical Officer in Charge at RNH Haslar abmitted a letter to MDG(N) for her to be oasidered for promotion to Nursing Officer arrangements were made for her to be nterviewed in Jannaary 1964 and she stopped off in ondon for the interview en route to her next drafi at HMS *Fulmar* Lossiemoath The interview board recommended her as a saitable candidate providing she completed four months of her drafi ond a six month staff nurse coarse at a suitable civilian hospital In June 1964 she was seconded to Stoke Mandeville Hospital Aylesbary to undertake daties as a Charge Nurse returning to RNH Haslar for promotion to Nursing Sister in J nuary 1965

Her first two years as a Nursing Sister were in RNH Plymoath She attended a Urologieal Coarse at St Peter s Hospital Loadon in Aprnl 1967 returning to RNH Haslar and was promoted to Senior Nursing Officer December 1967 Followiag this she served in the Royal Naval Hospitals Malta and Haslar and was promoted early to Aeting Superintending Sister in Febraary 1975 when she became the Nurses Regulating Officer Her rank was made substaaove in December that year

Her last appointmeat in the Service was as the Medical Branch Drafting Officer which she commenced in September 1977 She left the Service in September 1979

Kay as she was known to her colleagaes was the first Wren SBA to join the QARNNS the first QARNNS raing to be promoted to a Nursing Officer and to many who served with her the first to whom many of her colleagues would turn for advice Her efficiency common sense outstanding qualities of loyalty charming personality and good humoar were consistent throaghout her Service career and these qualities were well recognised by her colleagaes and frieads

Kay married in retirement sadly becoming widowed a few years later and I remember when talking aboat her husband Jan she told me how fortunate she w as in that she had a wonderful career in a job she loved and some years of great family happiness and that Jan left her a lasting legacy—she had two (step) childrca Jane and Mark Kathleen will be greatly missed and our sympathy goes oat to her family Jane and Mark and her many friends at St Mary s Church aad in the Alverstoke commaanty

Surgeon Captain (D) Eneas Burnett Mackenzie Royal Navy died on 12 Aagast 1997 aged 82

Surgeon Captain (D) T J C Hall OBE Royal Navy writes

Surgeon Captain (D) Eneas Burnett Mackenzie Royal Navy Mack as he was affectionately

known to all was one of a spirited and determined generation who served their country the Royal Navy and their professions well

He was born in 1915 in Tain Ross Shire and educated at Tain Royal Academy and Aberdeen Grammar School before entering the Edinburgh Dental Hospital There he gained First Class Honours in the final year his Hospital rugby colours and a University Half Blue for boxing He qualified LDS RCS (Edin) in 1936

Mack entered the Royal Navy in 1937 initially on a Short Service Engagement and joined HMS *Eagle* on the Chinese Station just four months before the outbreak of the Second World War having said farewell in England to Erica known to many of us as Paddy who he married in 1944 His meticulous personal papers tell that on 3 September 1939 *Eagle* was at sea off Colombo (70 East/6 North to be precise) Mack remained on board for the next two eventful years of active wartime service, until being reappointed in 1941 just one week before *Eagle* was lost in action

During that time he recorded that they steamed 90 226 miles and were attacked by the East Indies Station the South African Force the Mediterranean Fleet the Red Sea Force and the South Atlantic Station They were involved in the Malta Convoys and at Taranto and received a 250lb bomb in the landing room while off Singapore

It was typical of Mack's enthusiasm to lead from the front and never to spare himself that he applied during this time to *Eagle* for transfer to the Fleet Air Arm for pilot training Their Lordships responded that they valued his professional and paramedical skills and he was to remain in the Dental Branch

Among his appointments in the next four years of war saw him serving were HMS *Royal Arthur* then at Skegness HMS *Columbine* at Freetown a course at the Maxillo Facial Unit at East Grinstead (for all of two weeks) in London and just before VE day in USS *Merak*, New Jersey USA He was awarded the 1939/45 Star the Africa Star the Defence Medal and the War Medal He transferred to the Permanent List in 1945

He was appointed Specialist in Dental Surgery in 1948 and Senior Specialist in 1957 and contributed papers to the British Dental Journal on partial dentures and on his studies into the use of plastic emulsions for cavity lining The scope of his interests was apparent in the expertise he developed early on in the unusual skill of making acrylic prosthetic eyes This talent remained in demand throughout his career for patient care It was not unknown after a successful Mess Dinner for officer friends to find themselves being viewed from the bottom of their Wardroom tankards by one of Mack's technique pieces Perhaps even in especially bloodshot one to emphasise his point!

His Surgeon Commander years saw such varied service and experience as tours of duty in HMS *Tamar* in Hong Kong at the new entry training establishment HMS *Ganges* Shotley the Families Clinic in HMS *Phoenicia* Malta and the RN Hospital Chatham In *Ganges* he spent two years in charge of the fluoride investigation

He was promoted to Surgeon Captain (D) 1962 and over the next decade he served twice as Staff Dental Surgeon and Senior Specialist at the Royal Naval Hospital Gibraltar This could be, on albeit infrequent occasions a professionally lonely appointment for a Senior Specialist who faced more or less singlehanded with a case of severe facial trauma that would still be testing any of today's highly trained consultant maxillofacial surgeons But Mack's broad clinical experience and conscientious attention to all did invariably ensure a successful outcome His normally unfailing sense of humour was sorely tried though one long night when he had to rebuild the face of a young soldier who had just driven a Land Rover off the Europa Road right into the Mackenzie's kitchen and their newly purchased washing machine!

He was a keen golfer fisherman and a good shot who attained Command standard with rifle and pistol He was appointed Queens Honorary Dental Surgeon in 1970 and placed on the Retired List in 1972 However he continued to work for the RADC as a civilian for a further six years

Mack had a determined yet unassuming personality and an engaging and cheerful manner which never deserted him even when he suffered severely for many years with an incapacitating and painful hip He had a quietly mischievous sense of humour and a great capacity for friendship Many will remember the ready twinkle so often in his eye He was always keen to play his part in Wardroom activities and was a popular officer with both his contemporaries and his juniors who quickly sensed his deep sense of decency fair play and fen

He is survived by his wife Paddy who lives in Alverstoke and by their son Peter who is a teacher at Dundee High School We extend our deepest sympathy to them in their loss

urgeon Captain Gerald Sutherland Irvine BF Royal Navy died 9 August 1997 at the age of 3

urgeon Captain Peter Head OBE Royal Nav writes

Gerard Irvine was born in India in June 1913 the on of an Indian Army Major married to the laughter of Major General Wylde RMLI Like so many other military families Gerard suffered the oss of his father in action in 1917 Educated at psom College and later as a medical student at University College Hospital London he was one f the few remaining Naval Medical Officers who ntered the service before the outbreak of World War II As a medical student he met and married is beloved wife Phyllis in 1939—a very happy arriage which stood the test of 49 years Their on Martin who later rose to the rank of ommander Royal Navy was born in 1942 Like thers at that time Gerard only saw fleeting limpses of his family during the war serving at ea and ashore including his first ENT specialist ppointment in HMHS *Oxfordshire* Many other aried appointments followed including HMHS *itu Maidaon Osprey Trincomalee* and RNH ighi Malta, gradually progressing in his chosen peciality Ear Nose and Throat Surgery nevitably he achieved consultant status at RNH aslar being awarded an *ad eundum* FRCS in 968 for his untiring efforts to promote his peciality at a time of great change both in ENT urgery and the Royal Naval Medical Service erard often appeared brusque and strict but he vas a fair disciplinarian He was moreover a taunch friend with high ideals who fully upported his juniors—but beware any young fficer seen wandering around in a flapping ndone white coat! On retirement he was rewarded he CBE in 1970 A kind and loving family man erard was devastated by the sad loss of Phyllis in 988 But despite an increasingly severe hearing loss he continued with great enthusiasm his upport of the Masonic Order in which he chieved high office after 50 years membership A entleman of the old school Gerard will be sadly issed by his many friends and professional olleagues

urgeon Captain C O I eC Hughes OBE Royal avy died on 21st of October 1997

urgeon Captain J R Hunnam writes

I ecil Owen LeCocq (Peter) Hughes was t most roficient specialist medical officer who had a keep interest in radiobiology and radiation protection matters He played a pivotal role in setting the radiological protection standards for the naval nuclear powered submarine programme The Admiralty Board adopted these standards to ensure that shipboard and naval base standards and practices would be no less stringent in the Royal Navy than in the civil nuclear area This policy exists to this day and is regularly announced in parliament by Defence Ministers

Peter was born on 10 May 1924 in Norwich and studied medicine at Liverpool University qualifying in 1948 Following house jobs he joined the Royal Navy in 1949 and started immediately to study radiological defence at the RN Medical School Alverstoke He spent around four years in several general medical duties' posts and then having been accepted for a second short service commission in 1953 he started work at the Atomic Energy Research Establishment at Harwell Oxford Following this he returned to the RN Medical School as a Lecturer in Radiobiology in 1954 and accepted a permanent commission in 1955 He continued his interests in this area with appointments in the Pathology and Radiobiology Department at Haslar and during this period obtained his Diploma in Clinical Pathology

With his interest in health physics and radiation protection he was appointed to the HQ Task Force Grapple as the naval medical officer supervising the crews involved in the UK atomic weapons test programmes in the Pacific Following this he went back to Harwell to work with the Ship Department Dreadnought Project Team (Nuclear Safety) MDG(N) had accepted (reluctantly) that medical staff would be responsible onboard and ashore for radiological protection in the new nuclear fleet and it was Peter's job to assess the scale of the task and set up the appropriate procedures to ensure the practices were safe He was responsible for writing the detailed instructions for use throughout the navy and for advising on the training programmes for the medical staff who would serve in the RN's first nuclear powered submarine HMS *Dreadnought* and the subsequent boats He was the natural choice for the first Head of the Naval Radiological Protection Service based at the Institute of Naval Medicine, Alverstoke, which later became the Defence Radiological Protection Service The award of the OBE in 1965 recognised his major contribution and the scientific and intellectual challenges involved in setting up the radiological protection programme for the Royal Navy During this time he had also gained his MRCPath In 1963 he was a founder member of the Society of Radiological

Protection was President from 1969 to 1970 and was elected a Fellow in 1990. In 1963 he was a founder member of the Society of Radiological Protection, was President from 1981 to 1970 and was elected a Fellow in 1990.

Peter's long association with the expanding nuclear submarine flotilla continued with an appointment to the Naval Nuclear Technical Safety Panel as the Deputy Chairman. This Panel exists today as the nuclear auditor of the naval nuclear propulsion programme. He was promoted to Surgeon Captain in 1972 and served for a further two years as Head of the Naval Radiological Protection Service and then three years as the Flotilla Medical Officer to the Flag Officer Submarines at HMS *Dolphin*. He was appointed Queen's Honorary Physician in 1978.

At the professional level he retained a great interest in the mechanisms of radiation induced nausea and sickness and fostered work in several NATO Scientific Advisory Committees to advance the use of anti emetics in nuclear war operational scenarios. This work led to the Navy retaining until recently the UK expertise in this area. The end of the Cold War and the reduced probability of the field use of tactical nuclear weapons has now effectively removed the operational requirement for such expertise.

At the end of a distinguished Naval career Peter retired in 1982 and became a Home Office Inspector of animal facilities in the South of England. He had a great interest in and love of animals and so he was able to monitor establishments conducting animal research. Through his personality and charm he overcame resistance to change and obtained the cooperation of the researchers in what was considered another most successful job. He retired from this second career at the end of 1988.

In 1949 he married Margaret Addison and she became a practising psychiatrist. They had two children, Ann and Huw, who are both married with children. Huw is now working in Delaware as an immunologist. Sadly Margaret predeceased him dying from cancer in July 1987. However out of that great sadness came great happiness when he met and married Rosalind Orr widow of Commander Thomas Orr in 1987. They spent six very happy years together and travelled the world enthusiastically. During their last trip to Switzerland Peter became ill and died unexpectedly on 21 October 1997 (Trafalgar Day) from complications following pneumonia.

Peter will be remembered as an extremely sociable and professional friend. He was very supportive of his staff. He always strove to improve safety standards. He avidly encouraged juniors to undertake scientific research and publish their work. The high standards of radiological protection in the submarine flotilla over the last thirty five years owe a direct lineage to the sound foundations set during his early seminal work in the Dreadnought Project. However those of us who worked with him (or for him!) will remember him as a caring friendly man who served his fellows well and above all made life fun for them.

We have also learnt of the death of **Surgeon Rear Admiral John Mansel Rose CB OBE** on 1 July 1997, of **Surgeon Rear Admiral Job Morley Holford CB OBE** on 4 November 1997, of **Surgeon Captain John Archibald Norman Lock** on 26 September 1997, of **Surgeon Captain (D) Frank Thomas Heaton** on 1 October 1997, of **Surgeon Commander Kenneth George Ormond Gordin** on 16 August 1997, of **Surgeon Lieutenant Commander Richard Robert Barnetson Baxendine** on 12 October 1997, and of **Surgeon Commander P R French RD RNR** on 25 December 1997.

Our sympathy is extended to the relatives and friends of all of the above; any personal reminiscences will also be welcomed by the Editor.

Service News

ROYAL NAVAL MEDICAL CLUB DINNER 1997

The annual dinner of the Royal Naval Medical Club was held in the Commando Forces Officers Mess Royal Marine Barracks Stonehouse, Plymouth on 12 September 1997 when **Admiral Sir Hugo White** GCB CBE was Guest of Honour The Medical Director General (Naval) **Surgeon Rear Admiral M P H W Paine QHS** presided and gave the following speech

Admiral Sir Hugo distinguished guests and fellow members of the Royal Naval Medical Club I gives me great pleasure to welcome you to the Royal Marines mess tonight. We are most grateful to Colonel Bancroft for allowing us to hold our dinner here this year I am sure you would all wish me to thank the staff for the excellent meal we have just enjoyed also Colour Sergeant Hill and Corporal Fairey in the front of house and Mr Blackwell in the galley We have also been splendidly entertained by Her Majesty s Royal Marine Band of HRNC Dartmouth under the direction of Warrant Officer Bandmaster Ryan and also the soloist Corporal Banbury Finally my thanks to Surgeon Commander Calnin MeArthur for organizing everything so well

This is the first Blood Red Dinner we have had in the West Country since the demise of RNH Plymouth It is good to see so many civilian guests from Derriford MDHU Derriford is an important part of our ability to train for our war role and we owe an especial debt of gratitude to the civilian consultants at Derriford for this work. I also see that the RN Dental Service is well represented—they have also been through the Valley of Tears but are hopefully now reaching the quieter uplands

The Royal Naval Medical Service needs to concentrate on the future—not the past Like it or not we are now a leaner service that is still required to provide the best possible operational Medical service to the Fleet. Future efforts must be aimed at this and not in re creating a past age Catchment areas have been lost—the NHS has changed and so must our relationships—Calman lives

Most of you will be aware that a Defence Operational Capability Audit was conducted on all three Medical Services last year under the leadership of Brigadier Ridgeway It will come as no great surprise that they discovered significant deficiencies in [illegible] training and equipment The only Brownie point was that they accepted that only the RN had medical doctrine

The DOC audit spurred the Chiefs of Staff to commission an operational medical study to review the workings and resources of the Medical Services Directed by Brigadier Smedley and including Surgeon Commander Andy Hughes for once not up a mountain the team reported in July this year They identified the true requirements and deficiencies and spelt out the remedial work required This work has a high cost and will take many years to achieve On the manpower front they identified retention as the problem I have no doubt that this is correct. Recruiting is not our main concern Medical and Dental students continue to be attracted by cadetships and I am impressed by the quality of candidates presenting at the Admiralty Interview Board They certainly seem to enjoy their early years We must make certain that they stay

I see the problem of retention under three main headings Training Terms of Service and Pay Dealing with the last point, I believe that now we have consolidated our pay for pension purposes we have a basis to go forward I realise that the main beneficiaries will be our successors but it is a start

A robust training package is the next most important retention plank All short career officers are offered three years general professional training within their initial six year commission Derriford and Haslar offer excellent packages and provided they do not all opt for one specialisation we are able to meet their aspirations Extensions to Short Career Commissions are available I see these as useful in allowing flexibility in two areas For those whom we wish to retain but who have not yet met the entry requirements for Calman training we can offer extension those already vocationally trained—mainly GPs who wish to undertake a particular appointment can extend

It is theoretically possible to extend an SCC to encompass both acquisition of CCST ASCAB and the three years Return of Service. Since 1st of April this year this leaves the individual with the same reserve and Return of Service liability as someone on a Medium Career Commission but no immediate pension I think they would be daft to

consider this option I am heartened that eleven medical officers have applied for the reintroduced Medium Career Commission However I am under no illusion that we have much work left to do before we can be seen as an attractive career option

We can offer first rate higher professional training packages Personnel are encouraged to undertake research and overseas fellowships are available For Occupational Medicine training, INM and the Dockyards provide posts that give depth of experience that is applicable to our operational role Master of Medical Science courses are available at Birmingham University For GPVT apart from good maternity at Haslar the MDHUs and some NHS hospitals there are training practices in HMS *Warrior* Gibraltar and attachments elsewhere with the NHS We are also developing the use of Army practices

On Terms of Service I am determined that we should treat our people like adults—after all they occasionally masquerade as such One aspect I am determined to alter is PVR notice For those without a return of service I believe that this should be within the norm found in civilian life We are also undertaking work to finalise the 3-Tier Commission and substantive One Star rank

I remain very concerned over the ownership of our greatest single asset—the medical manpower There is no doubt in my mind that all members of this Club joined the Royal Navy to serve our Queen and Country is we felt able—at sea and supporting the Royal Marines We must re-establish the fact that all members of the Royal Naval Medical Service are owned by the Royal Navy

The recurring theme in the reports to Chiefs of Staff is the lack of any focal point for delivery of medical support both centrally and in the single Services They recommended Surgeon General should be the central focal point and he should hold the budgets for the Defence Medical Agencies Medical Directors General must be responsible for delivering the single service components It is my firm belief that MDG must be given the responsibility for providing CINCFLEET with the operational medical support to enable him to meet the commitments the government asks of him I am currently proposing that MDG be given responsibility for all primary and occupational medical support This would allow me to exert more control over these assets and thus permit greater freedom in our search for excellence I believe there is a need to concentrate all medical Staff Officers in one headquarters organization—although working from separate sites I believe that the ownership of DSC personnel should be returned to the single Services I see the DSCA as an employment agency and a deliverer of secondary care You will not be surprised to hear that this view is not supported by the Chief Executive

What have we achieved since my predecessor reported to you? There have been many individual achievements Recently Surgeon Lieutenant Suzanne Porter the Medical Officer on HM *London* had to skipper a yacht found abandoned and drifting in the Atlantic With a Prize Crew but no internal power she successfully sailed the 500 nautical miles to Naval Station Rooseveldt Roads in Puerto Rico

Surgeon Lieutenant (D) Madgwick won the Gold Medal for the best dental student in the University of London and Surgeon Lieutenant Armstrong won the Commando Medal as the top student on his course Commander John Dalgleish was awarded the Parkes Memorial Prize by the RAMC for his PhD dissertation—when he became Doctor Dalgleish a warning was sent out by FOSM that he was not the sort of doctor for whom you dropped your trousers

Collectively RFA *Argus* with medical enhancements was involved in the evacuation from Sierra Leone medical staff in Freetown have taken part in 166 rescues including a horse You will have all seen pictures of the recently returned Ocean Wave deployment group Twenty ship submarines and Commandos were deployed to Australia and the Far East one hundred and twenty three casevacs gave the RAF some justification for their existence the Royal exercised both in jungles and with their specialist divers—in the latter case covered by divin medical specialists from INM Ocean Wave demonstrated the need for occupational and primary medical support and secondary care both in and out of theatre

You are all doubtless aware of the strategic Defence Review being conducted at present We expect to see a White Paper in January—but for once I am not overanxious. We will be expected to support whatever forces the SDR allows we will not be arbitrarily cut This is the most we can expect

It is recognised that we have shortages in certain categories and anomalies of skill mix To ameliorate such shortfalls we will continue to need Reserves as well as Regulars and it is good to see so many members of the RNR here tonight Your role will continue to develop and I look

forward to a closer relationship with the RNR Team work is going to be essential if we are once gain going to have a strong and effective Royal Naval Medical Service The doctors are a part of hat team as are the dentists nurses and Medical Branch ratings It is good to see all four groups epresented here tonight

In conclusion I believe it is essential that the Royal Naval Medical Service looks to its future nd does not reflect too long over a different era Where the pace of change was much slower It is uite clear that there can be no return to the days of ingle service hospitals Indeed the critical mass eeded for modern training recognition requires a tchment area of about half a million Whatever ur personal feelings we must work ever more losely with our NHS colleagues but without osing our single service identity

I would like to thank all of you here tonight for our support in difficult times I hope you don t eel your loyalty has been taken for granted—it s ist we rarely seem to have time to say thank you lowever this is a grand and appropriate occasion ar thanks I hope I can continue to count on your upport in the future Some of us believe that hroughout the recent Angas only medics were ighting to maintain the necessary operational nedical support Having served for four ommanders in Chief Fleet I am aware that these oncerns reach to the very top and this has always een the case Indeed Admiral the Earl St Vincent rote that Injured men lying around untreated estroy the fighting morale of the ship I ask you vas he considering a comprehensive health care ackage—or pushing the casualties over the side ? would have had no doubt with our Guest of Honour

Admiral Sir Hugo White entered the Royal avy in 1958 and served in many diesel ubmarines with such historic names as *Tiburon* *uptne Odin Osiris* and *Oracle* which he ommanded It was in *Oracle* that during perations near or beneath the ice he decided to nliven things by firing a live Mark 8 torpedo at an eeberg All wanted to see the spectacular results Time passed and then nothing To this day esidents of Spitzbergen are still puzzled as to how hey had offended the Soviets' He had a notable uccess as the first Commander Submarine Sea raining After submarines Admiral White ommanded *Salisbury* during the Cod War dmiral Boyce informs me that his conduct upheld the finest traditions of Drake and Henry Morgan

In command of *Avenger* as Capt F4 in the alkland Campaign he was responsible for establishing the safety of Albermale Harbour as a bolt hole and was on perpetual NGS especially around Fitzroy and Bluff Cove Ending the war by taking the surrender at Fox Bay Admiral White was heard to comment that the war was fun the peace hell

His final command was *Bristol* as Flag Captain 2nd Flotilla a warm indeed frankly hot command After penance in MOD and elsewhere he stepped on to the fast elevator and was in short succession FoF3 ACNS and FOSNI before promotion to full Admiral as CINCFLEET CINCHAN (last) CINCEASTLANT and COMNAVNORWEST In December 1995 he became Governor and Commander in Chief Gibraltar It was during his time as Commander in Chief Fleet that he was a great friend to the Medical Branch fighting hard and long to retain a Royal Naval operational medical capability Where we lost we have now been vindicated and this was accepted by CDS on 5 September

Ladies and gentlemen of the Royal Naval Medical Club I ask you to rise and drink a toast to 'Our Guests

Admiral Sir Hugo White GCB CBE replied on behalf of the guests

Admiral Paine, fellow guests ladies and gentlemen I feel very honoured to have been asked to be your principal guest tonight. It has been a glittering occasion and the mess has produced a first class dinner which I have very much enjoyed and for which I am exceedingly grateful I would also like to thank you on behalf of all the other guests

I am not at all sure why I was selected to hazard the evening at this stage as an officer who is both over the hill increasingly far away and preoccupied with the daily residual marble muster but Admiral Mike kindly warned me that he would hand you over in a state of deep coma so maybe you will not notice the change of voice and can go on enjoying a little well earned down time

So far in retirement my morale has remained satisfyingly high Nobody has yet offered me their seat in a bus I have not yet had to face the psychological challenges of grandfatherhood but I have been talking to a number of people who have crossed that threshold One such told me that his young grandson had asked him if he could croak like a frog He had said he couldn t and enquired why the boy had asked Oh came the reply Mummy said when you croaked she would take us to Disney World

Another more ancient grandfather was asked solemnly Grandpa were you in the Ark with Noah? Certainly not came the indignant response Well why weren t you drowned then? It was this reference to the Ark that had me pondering when the first medics went to sea in a professional capacity and I have studied the Noah story carefully in the Good Book for clues

Point one was that Noah needed a lot of help Apart from anything else he was pushing his 600th birthday and no longer in his prime The Almighty had seriously gone off the human race and had dished out clear but extremely broad and challenging directives Take the Ark first There was to be no messing about with minor designs it was huge A world beater by any standard it was massively larger than any subsequent marine construction for the next 6 000 years Double the size of Nelson s *Victory* the Ark was a three decker some 450 feet long 75 foot in the beam and 45 feet high There is no record of a bridge or look out platform sail oars or rudder The thing was just one vast floating hull designed to be at the mercy of wind and seas with all the sickening ship movement that that implied

The rubric for crew membership was simple but daunting One healthy pair of every member of the animal kingdom in earth and sky Just imagine the advertising and screening process not to mention the potential health hazards Think of the embarked insect component the snakes scorpions poisonous spiders and so on which must have been easy to tread on or be sick over even if everyone was on their best behaviour And yet there is no hint of vets let alone doctors or dentists

It seems that the Good Lord had incomprehensibly omitted any medical annex from his op order and without his prompting Noah wasn t going to budge an inch from his nepotist stand that only his immediate family were to embark You can imagine the large numbers of enthusiastic crew hopefuls increasing as the rains set in whom Noah must have strung along with rumours of a lift on launch These must have included some of your noble predecessors recommending perhaps simple first aid kits or modest but potent cures for sea sickness and unexpected outbreaks of diarrhoea from creatures small and very large

No dice Noah was a hard man with powerful top cover Come the launch it is difficult to imagine any disinterested cheering as the water rose to neck level amongst the spectators and presumably all medical knowledge outside the Noah family perished that day

Roll forward five millennia or so to what i called modern history and we have a different an much more reassuring story afloat. I have not ha time to trawl through primitive naval tradition t discover who treated blisters or toothache in th galleys but by the time the Royal Navy was rulin the waves from Good Queen Bess onwards th medical profession was firmly ensconced as a vit component in Her Majesty s ships By the 18t century as all disciples of Patriek O Brien wi know warships carried one surgeon and often on or two assistants And they did not lead an eas life

I was reading the other day of the challenge facing the ships engaged in suppressing the slav trade off the West African coast In four month during 1829 cruising between Sierra Leone an Fernando Po the ship s company of the *Eden* ha an epidemic of yellow fever which killed 123 me out of her complement of 135 including tw surgeons and two assistants The disease wa firmly believed to be contagious and so any sh which developed a case suffered plummetin morale

It was to check this that the following ye Surgeon McKinnel on the same coast in the gov ship *Sybille* performed a particularly unpleasa and heroic act when the disease broke out in hi ship and the men saw themselves as doome Convinced that yellow fever was not contagious he collected a wine glass of black vomit from fever stricken seaman toasted the officer of th watch with the words Here s your health Green Green was the operative word—and drank it ot The news spread round the ship in a momen Everyone crowded around him to watch him dr and were amazed to see him walk the quarterdec for an hour and then appear for dinner with h appetite unimpaired.

It is a measure of the extraordinary advances Medicine that today s Naval surgeons no long have quite such prominence on board Excella medical facilities and universal good health all t easily get taken for granted Indeed in the long ga between the Korean and Falkland s War there w a risk that the fundamental importance of havin properly trained surgeons and back up on boar all ships that are sent in harm s way began to l forgotten

Even after the Falklands and Gulf Wars th verity came under pressure in the post Cold W clamours for peace dividends through Options f Change and particularly the more searchi Defence Costs Study I have been outside Nav business now for nearly two years but I can vivid

remember at Northwood [illegible] by our present Admiral arguing that the proposed cuts in medical services were going too deep to the detriment of both the Medical Service itself and the Fleet. It is of course all too easy to criticise from the front line MOD warriors beset by financial pressures which were huge. Admiral Mike tells me that since then the damage has been recognised amity is returning and hopefully recovery will follow and I am very relieved to hear that there are at least these grounds for optimism.

Ladies and gentlemen I have droned on for far too long in a poor return for your kind and outstanding hospitality. A chum of mine once had to lecture after lunch on a hot day to a very senior officer about the Sea Slug missile system. Within five minutes his audience of one was asleep so soundly indeed that the place soon shook with his snores. My chum kept at it regardless in case his charge suddenly awoke but after 40 minutes the lecture completed he knocked the chalk box off the lectern with a crash and said loudly. And that, sir concludes my lecture on the Sea Slug missile system. The great man stirred smiled gratefully and without a hint of embarrassment said. Thank you [illegible] I saw to the serving officers present what I should have said to you all when I was at Northwood but never had the opportunity and that is. Thankyou. I have taken the trouble to contact the present Commander in Chief. Admiral Abbott who has asked me to relinquishing the reins to his successor to add his sincere thanks to mine. As we both well know collectively you set very high professional standards indeed, which are respected and indeed relied upon by the Fleet.

You have had to and I expect still are coping with unwelcome changes to the medical service but cope with them I know you will because of your corporate loyalty to a Navy and a Fleet which cannot fight without you and whose traditions and worldwide reputation demand the support that its doctors and dentists have selflessly through the years never failed to provide. So again a heartfelt thank you and to all of you thank you again for an excellent dinner thank you for listening so politely and every good fortune to you for the future.



Gilbert Blane Medal

Surgeon Commander Neil Cripps receives the Gilbert Blane Medal [illegible] Royal Navy Medicine



Primary Care Symposium
A most successful Primary Care Sym[illegible] at the Institute of Naval Medicine over three days in Septemb[illegible] Delegates and several contributors are p[illegible] with the Medical Director General Surgeon Rear Admiral Paine, wh[illegible] opened the meeting

Sick Berth Petty Officers Efficiency Medal
The Sick Berth Petty Officers Efficiency Medal for 1996 has been awarded to **Petty Officer Medical Assistant G A Todd**.

NATO medals
CPOMA Alan Wallace and **POMA Ian Hubbard** have been awarded NATO (former Yugoslavia) Medals for operational duties in the Adriatic in HM Ships *Battleaxe* and *Campbeltown* respectively

Academic achievements
Surgeon Commander J K Campbell has been appointed the Royal College of Surgeons Clinical Tutor for the Plymouth Hospitals NHS Trust

Surgeon Lieutenant G L D Howell has been successful in the Intercollegiate FRCS (Orthopaedics) examination

Surgeon Lieutenant S J Dickson has been successful in Part I MRCP

Consultant Grading successes
Surgeon Commander N A Hedger attended ASCAB chaired by the President of the Royal College of Physicians on 15 December 1997. His Consultant Status was unanimously approved by the Board in Renal and General Internal Medicine

Surgeon Commander M H Lygo successfully appeared before an ASCAB in Occupational Medicine on 14 November 1997

Exchange Officer promotion
Commander P D Hunt MC USNR, the US Navy Exchange Officer serving at the Institute of Naval Medicine received confirmation of his permanent appointment as Captain in mid December

ROYAL NAVAL MEDICAL AND DENTAL OFFICERS

APPOINTMENTS

As Director of Medical Organisation in the rank of Surgeon Commodore to date 21 October 1997
R D Corr

As Consultant Adviser in Medicine to Medical Director General (Naval)
Surgeon Captain W M Edmondstone

As Consultant Adviser in Surgery to Medical Director General (Naval)
Surgeon Commander D N Tulloch

As Adviser in General Practice to date 26 August 1997
Surgeon Commander N E Bevan

PROMOTIONS

To Surgeon Lieutenant Commander
L S Randall N J Yarnall

To Surgeon Lieutenant
K R E J Prior S L Shaw
J D McIntosh S D Hutchings
D R McAllister J Rahman

To Surgeon Lieutenant (D)
W B O Chittick A J Hands
S J Jessiman K H Taylor

To Acting Surgeon Lieutenant
S M Collett G C Evans A R L Allsop J Carty
A J R Cormack D A T Guy F M Knight W D Norris
J F Welch D E Payne F J H Binns L A Pearce

TRANSFER TO FULL CAREER COMMISSION
Surgeon Lieutenant Commander S I Tanser

TRANSFERS TO MEDIUM CAREER COMMISSION
Surgeon Lieutenants B J Dekker R M Heames

NEW ENTRIES
Surgeon Lieutenant A D Kehoe

[redacted] K J [redacted]
Surgeon Sub Lieutenant (D) A M Dew
S A F J Bennett S N J Fairhurst
Surgeon Sub Lieuteoant (D) J N McDicken

PLACED ON EMERGENCY LIST
Surgeon Lieutenant Commander D P Badham
Surgeon Lieutenant Commander (D) J Brandon
Surgeon Lieutenant Commander (D) M Kelly
Surgeon Lieutenant T E Ronaldson

RETIREMENTS
Surgeon Commander S D Glover
Surgeon Commander C D Gillen
Surgeon Lieutenant Commander S S Cooke

MEDICAL SERVICES

NEW ENTRY
Sub Lieutenant S E Goodrum

RETIREMENTS
Lieutenant Commander R J Pullyblank

QUEEN ALEXANDRA'S ROYAL NAVAL NURSING SERVICE

PROMOTIONS

To Lieutenant
S A Zeigler

ROYAL NAVAL RESERVE

APPOINTMENTS

As Medical Support Assistant Co ordinator to date 1 December 1997
Acting Surgeon Commander J A McM Turner
King Alfred

NEW ENTRY
Probationary Acting Surgeon Lieutenant
N R Hayman *Northwood*

CONFIRMED IN RANK
Acting Surgeon Lieutenant J A Seaton
Vivid

RETIREMENTS
Surgeon Lieutenant Commander H A W Neil
President

ACCOUNTS FOR THE YEAR ENDED 30 SEPTEMBER 1997

PROFIT AND LOSS ACCOUNT	30.9.97		30.9.96	
Income	£		£	
Journal subscriptions	8 365		8.567	
Profit on sale of Plymouth booklet	0		1	
Advertising revenue	1 668		2 700	
Interest received	581		612	
		10 614		11 88
Expenditure				
Printing and distribution costs	12 860		12 451	
Office overheads	141		221	
Audit and accountancy	100		100	
Bank Handling Charges	20		20	
		13 121		12 79
(Loss) for the year		(£2 507)		(£912

BALANCE SHEET

	£	£
Current Assets		
Investment Account	11 251	10.77
Current account	3 120	3 88
Stocks - Plymouth Hospital Booklet	867	86
Advertising revenue owing	550	
	15 788	15,50
Creditors	2 895	10
	£12 893	£15,40
TOTAL NET ASSETS		
Represented By		
Balance at 1 October 1996	15 400	16 31
Surplus for the Period	(2 507)	(912
Balance at 30 September 1997	£12 893	£15,40

Accountants Certificate

We have examined the books and records for the year ended 30 September 1997 and obtained all the information and explanations considered necessary for the audit. In our opinion the accounts show a true and fair view of t state of affairs of the fund at 30 September 1997 and of the income and Expenditure for the twelve month pen then ended.

Brooks Bruce,
Certified Accountants

Note Although the accounts show a loss over the operating year the Management Committee has decided th in increase in subscriptions is unnecessary as cost control introduced in year will reduce losses and there a adequate reserves. The situation will be kept under review.

G H G McMillan, Chairman

Notices

Management Committee

urgeon Commodore G H G McMillan *(Chairman and Editor)* Surgeon Captain (D) J V Holland urgeon Captain R Corr Commander J B Gauld QARNNS Surgeon Commander R F Dale ommander F Reed Surgeon Commander R H Taylor Surgeon Commander P I Kaffiehh Irs J Southwell *(Secretary)* Dr R J Pethybridge is the Editor s Statistical Adviser and Surgeon Captain D) E J Grant (Reid) is the Journal s Assistant Editor

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s Winter Spring and Summer edition of the Journal of the Royal Naval Medical Service is published ach year one volume comprising three issues The rates of subscription are

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Notice to authors

Contributors to the Journal of the Royal Naval Medical Service are reminded that the full text of Notice o the Authors was published in the Summer 1994 issue and are advised to consult this before submitting papers to the Editor for consideration for publication in the Journal

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To Commander Geoff Marshall Royal Navy,
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Institute of Naval Medicine,
Gosport, Hants PO12 2DL,
United Kingdom

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Date	Tour
16 February - 1 March	Ethiopia Ancient Contemporary
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10 - 24 March	Dental Study Tour to Cuba in association with the Probe
14 - 21 March	Health in Cuba in association with the Institute of Health Services Management
25 March - 9 April	Children of China
15 - 29 April	Medical Study Tour to China in association with GP Magazine
6 - 20 May	Health Care Study Tour to Peru
16 - 24 May	Health Care Tour to South Africa
30 May - 7 June	Health Care Study Tour to Hungary and the Peto Institute for professionals working in Therapy & Rehabilitation
6 - 21 June	Mental Health in China
30 June - 15 July	Health Care Study Tour to Ladakh (North India)
9 - 24 September	Midwifery and Child Care Study Tour to China
17 October - 1 November	Health Care Study Tour to Sichuan and Yunnan (South West China)
4 - 19 November	Health Care Study Tour to China for professionals working in Therapy and Rehabilitation
8 - 22 November	Health Care Study Tour to Ecuador and the Galapagos Islands Community Care in Cuba
3 - 17 November	Community Care in Cuba
9 - 23 November	Optometry Study Tour to Cuba supported by the Association of Optometrists
17 November - 2 December	Medical Study Tour to Cuba

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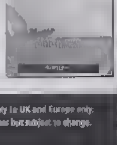
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